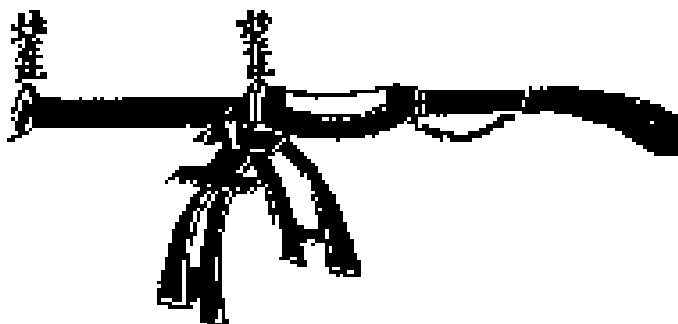


Arms and the Asian

Revisiting European Firearms and their Place in Early Modern Asia

SANJAY SUBRAHMANYAM* & GEOFFREY PARKER**



Bluntschli: “I’ve no ammunition.
What use are cartridges in battle?
I always carry chocolate instead;
and I finished the last cake of that yesterday”.
G. B. Shaw, *Arms and the Man* (1894).

I

Cartridges or chocolate? Not guns or butter? In his 1894 play, *Arms and the Man*, the once celebrated but now largely forgotten Anglo-Irish playwright George Bernard Shaw presents a central paradox of modern warfare. The play proved to be an instant success in the decades before the First World War, when many Europeans eventually came to feel cynicism and even despair regarding the futility of war, especially wars between two relatively well-matched armies doomed to prolonged attrition and blood-letting. Shaw set his play in the Balkans, where he and his audience

believed wars would be short and decisive, and the two central male characters are nicely paired as they vie for the attention of the principal female personage Raïna Petkoff. Sergius Saranoff is a handsome, boastful, Bulgarian cavalry commander, straight out of comic opera, who makes it a point of honour to insist that he never apologizes. When he is not preening or posturing and flirting in salons, he leads cavalry charges that make little tactical or strategic sense because he believes that wars are won simply through a display of physical courage and superior determination. Shaw does not contrast him with the devious figure of a cad or bounder (such as the fictional Harry Flashman from *Tom Brown’s Schooldays*), but with a man of calm and calculation: the Swiss volunteer Bluntschli, descended from a prosperous family of hoteliers, ostensibly fighting for the Serbs. His character is reflected even in his physical appearance, for he is a man “of middling stature and undistinguished appearance,” with “a hopelessly prosaic nose like that of a strong-minded baby.” Bluntschli sees logistics and secret diplomacy as the key to modern war, preferring—as he says in the play’s best-known scene cited above—to carry chocolate rather than cartridges, in a variant on the celebrated adage that an army marches on its stomach. The two, Sergius and Bluntschli, present a perfect contrast between warfare viewed as a series of acts bound up with passion, morale and heroism on the

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WEAPONS, FORTS AND MILITARY STRATEGIES IN EAST ASIA – I

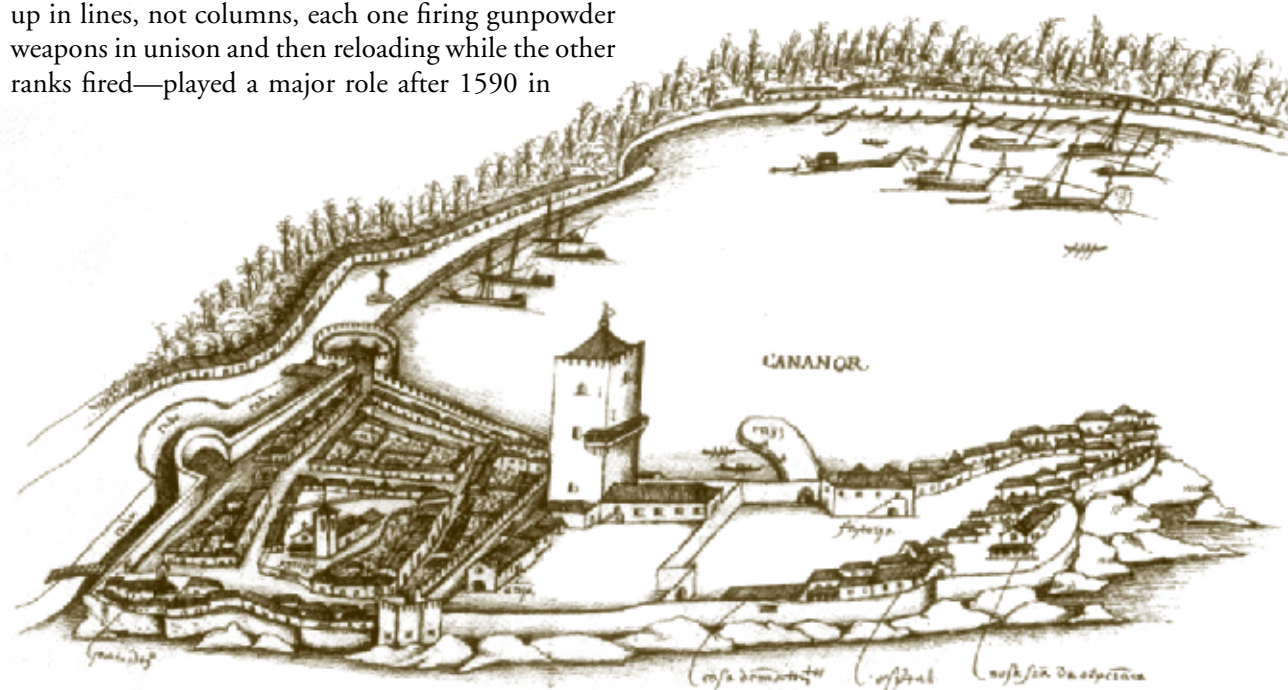
one hand, and as the embodiment of rationality and calm calculation on the other. The same paradox lay at the heart of early modern warfare.¹

This essay examines the paradox through the changing role played by firearms (whether European or non-European) in a variety of Asian armies and polities between about 1500 and 1800—a question hotly contested over the last two decades as part of the “Military Revolution Debate.” In Europe, the Military Revolution had four main elements. First, after about 1430, the development of heavy bronze artillery, efficiently using gunpowder, destroyed fortresses of the traditional vertical design which had once dominated strategy. The advantage in positional warfare thus moved from the defenders to the attackers until about a century later the second element of the “revolution”—the creation of artful fortresses of geometric design—restored the advantage to the defenders. Henceforth, in Bluntschli’s terms, chocolate rather than cartridges, supply-lines rather than sapping, would often determine the outcome of sieges. The third element was naval: in the early 16th century naval architects discovered ways to arm full-rigged sailing vessels with heavy artillery. This factor played only a limited role in the conquest of the Americas, but it proved critical in European overseas military successes elsewhere. Fourth, and finally, the invention of infantry volley fire—with infantry drawn up in lines, not columns, each one firing gunpowder weapons in unison and then reloading while the other ranks fired—played a major role after 1590 in

how European (and some extra-European) wars were fought and won.²

The European case already involves a fair amount of diversity, as the trajectory of the Military Revolution varies somewhat between Iberia and Ireland, or the Dutch Republic and Russia;³ but the variation is obviously far larger when one moves to a global scale between the 16th and the 18th centuries, ranging from the Americas and Africa, through Siberia and India to China and Japan. In some areas, European forces deployed some of the fruits of the Military Revolution to confront and overwhelm their rivals. Thus in both Mexico and Peru, the Spaniards had no particular need in the 1520s and 1530s of the benefits of the Military Revolution, for they conducted few sieges and fought even fewer naval battles. Faced with enemies unfamiliar not merely with efficient cannon, but even with handguns and steel weapons, the contest remained a deeply unequal one.⁴ Such was not the case when the Europeans entered the Indian Ocean. As the Portuguese in India never tired of pointing out, Asia was not like America: adversaries there were armed with firearms and steel swords, not with wooden clubs and obsidian knives. It was simply not possible for 168 men with 67 horses to

View of Cananore. In Gaspar Correia, *Lendas da Índia* (1st half of 16th century).



ARMAS, FORTALEZAS E ESTRATÉGIAS MILITARES NO SUDESTE ASIÁTICO – I

destroy the Mughal Empire, as Pizarro and his Spanish companions had brought down the Incas.⁵ Only the European artillery fortress proved a universal asset, enabling the newcomers to consolidate and defend what they had acquired.⁶

The “Military Revolution Thesis” argues that European overseas expansion and conquest did not take place through either general moral or material superiority, or through demographic or climatic pressure, but rather because the Europeans’ military and naval advantage often made such expansion both possible and profitable. As long as the forces of one European power sought to expand abroad—as with the Spaniards and Portuguese in America or the Russians in Siberia—even a slight military advantage (firearms, cavalry, small-unit cohesion) conferred a decisive advantage only against technologically isolated societies. Paradoxically, only after European powers began to compete against each other did further military and naval innovations allow expansion against even the most technically and politically advanced societies (India and later China). This then was the second, largely post-1650 phase, of the overseas career of the Military Revolution. Why, precisely, did European firearms not prevail in Asia sooner?

II

Gunpowder reached the European and Islamic worlds from China, where it may have been known as early as the ninth century from the serendipitous work of alchemists. The painstaking work of Joseph Needham and his collaborators has shed much light on the use of explosives, projectiles, and eventually gunpowder and handheld firearms in Chinese warfare.⁷ In Song times, there is evidence of the use of gunpowder not only in fireworks but for certain limited military purposes, as is suggested by the treatise from 1044 CE, *Wujing zongyao* 武经总要 (Essentials of the military arts). Yet although the trebuchet continued in regular use, by the time the first European fleets appeared in Asian waters, gunpowder weapons did not play a major role in Chinese warfare. Even the great Ming fleets of Zheng He 郑和 that sailed across the Indian Ocean in the 15th century apparently did not carry firearms. Paradoxically then, when the Portuguese appeared in East Asia in the 16th century they brought back something familiar in an unfamiliar form.

The situation in South Asia at the same time was rather different thanks to the persistent and direct contacts with the Middle East, and in particular with the Ottomans. Exactly when cannon and firearms entered regular use in South Asia remains open to debate, but evidence exists that firearms were known and used in western India, both in the Sultanate of Gujarat and the Deccan, by the 1490s. One well-known historian of the Mughals, Iqtidar Alam Khan, has suggested a slightly earlier date, but his views have been received sceptically—perhaps too sceptically. Khan’s arguments centre on the interpretation of the term *kaman-i rad* (or “thunder-bow”), and he suggests that the Bahmani sultans of the Deccan, for example, may have regularly used firearms in the latter half of the 15th century.⁸ Whatever the soundness of his philology and etymology, Khan’s views are not implausible. The Bahmanis enjoyed regular contacts with Iran, where firearms were in use from the mid-15th century (albeit with mixed success and some resistance from the military elite). They may also, like the contemporary sultans of Gujarat, have had contacts with the Mamluks and the Ottomans, both of whom were familiar with firearms from the 14th century, and who—in the case of the Ottomans—certainly manipulated cannon for the purposes of siege warfare with some finesse by the 1450s.

Firearms may also have reached northern India, and, by a combination of land and sea routes, western India, from Iran. Here diverse evidence suggests that the Aq-quyunlu (or “White Sheep”) Turkoman dynasty which ruled in the later decades of the 15th century were familiar with gunpowder weapons. The ruler Uzun Hasan (1453-1478), initially unable to oppose the Ottomans because they had firearms and he did not, in the early 1470s asked the Venetians to bring both military experts and firearms into his kingdom. Though the Venetians were willing to oblige, this move does not seem to have borne fruit immediately; but by the 1480s, matters had changed. The chronicler Fazlullah Khunji-Isfahani refers in this period to the manufacture of artillery, and to the making of new fortifications (*top sakhtan wa bina-yi shahr-i nau pardakhtan*), the latter perhaps in response to the new weapons. The report by an Ottoman spy, Muhammad al-Faqir, is even more explicit. He notes that in the context of a projected Aq-quyunlu invasion, their forces had set up headquarters in the Aras valley and were preparing to cast a large

WEAPONS, FORTS AND MILITARY STRATEGIES IN EAST ASIA – I

bronze mortar weighing nearly 4,500 kilograms there. The reigning Aq-qyunlu ruler Sultan Ya'qub (1478-1490) had brought in both Ottoman and Mamluk specialists to equip his army with firearms, as well as to cast a number of far smaller pieces, weighing in the region of 120 kilograms.⁹

In the event, gunpowder weapons did not save the Aq-qyunlu from defeat at the hands of the Safavids in the early 16th century. The first Safavid dynasty, Shah Isma'il (1501-1524), initially showed little interest in firearms, basing his power instead largely on Turkoman cavalry fired with a Shi'i messianic zeal. He seems to have left unused the cannon captured from the Aq-qyunlu, including a large bronze piece with a bore of 90 centimetres cast under Sultan Ya'qub and described by a Venetian visitor to early Safavid Iran. What happened to the firearms specialists hired by Ya'qub, both those who cast the cannon and those who used the smaller weapons (the so-called *zarb-zan*)? Did they simply return west to the Mamluk and Ottoman domains, or did some of them trickle eastwards to Khorasan and beyond, to urban centres such as Herat, then under the rule of the Timurid prince Sultan Husain Baiqara (1470-1506), who shared a frontier with his rivals, the Aq-qyunlu?¹⁰ Herat in the early 16th century was celebrated as a centre of the arts and poetry, but it also served as the point of transmission for other forms of "novelties" and technological innovations.

The origins of the regular use of artillery and firearms in northern India are thus far more complex than previously thought. We can trace two distinct vectors of transmission and at least three distinct routes. The first of these vectors (to which we shall turn presently) involved the Deccan, and the second northern India. The latter has attracted greater attention. Fragmentary evidence indicates the presence of firearms in the Lodi Sultanate centered on Delhi and Agra in the late 15th and early 16th centuries, almost certainly deriving from Iran and Central Asia. However they did not play an important role in the struggle between the Lodis and the Sharqi sultans of Jaunpur in the latter half of the 15th century, or in the reign of Sultan Sikandar Lodi (1489-1517). The point of transition came at the Battle of Panipat, fought just outside Delhi in April 1526 between the forces of Sultan Ibrahim Lodi and the Timurid prince Zahir-ud-Din Babur.

The major account of Panipat appears in the *Babur Nama*, written by Babur himself, and although his account is often frustratingly laconic and oblique, it stresses the use of both cannon and firearms rather clearly, a point emphasized in later Mughal paintings of the battle from the time of Babur's grandson Jalal-ud-Din Akbar (1556-1605).¹¹ While describing his preparations for the battle, Babur noted that in view of his relative numerical weakness, he ordered his men to bring several hundred carts which were then tied together, "with ox-harness ropes instead of chains, after the Anatolian manner, keeping a distance of six or seven large shields between each cart."¹² These were tactics that the Ottomans had apparently tried out with success against the Safavids in the Battle of Chaldiran in 1514. Babur's army protected itself on the right side with the suburbs and houses of the town of Panipat, and on the other sides with a mix of trenches, stakes and the makeshift array of linked carts, with gaps for the Mughal cavalry to emerge. Further, Babur decided that "the matchlock-men could then stand behind the fortification to fire their guns" against any advancing force.

Babur would have already known the role that firearms would play in his tactics. Some seven years earlier, in 1519, at Bajaur, his opponents are reported to have never seen matchlocks before and yet "showed no fear of [their] sound ... and even made fun of the noise with obscene gestures when they heard it." However, he persisted in their use, and some eight to ten Bajauris were eventually shot over a day's fighting; "thereafter," Babur writes, "it got so that no one could put his head up because there was so much matchlock fire." At Panipat, besides matchlocks, he apparently had at his disposal a variety of heavier arms, with names such as *zarb-zan* (a sort of falconet, which we have already encountered), *top-i firangi* (a heavy gun "in the Frankish style"), and a heavier mortar termed the *kazan*. During the engagement, Ustad 'Ali Quli (on whom more below) "got off a few good gunshots from in front of the center," while on the other hand "Mustafa the artilleryman also fired some good shots from the mortars mounted on carts to the left of the center."

Babur and his immediate entourage fought at Panipat on horseback, protected by body armour, because they planned for the Mughal army, spearheaded by cavalry, to attack the advancing Lodi forces on the

ARMAS, FORTALEZAS E ESTRATÉGIAS MILITARES NO SUDESTE ASIÁTICO – I

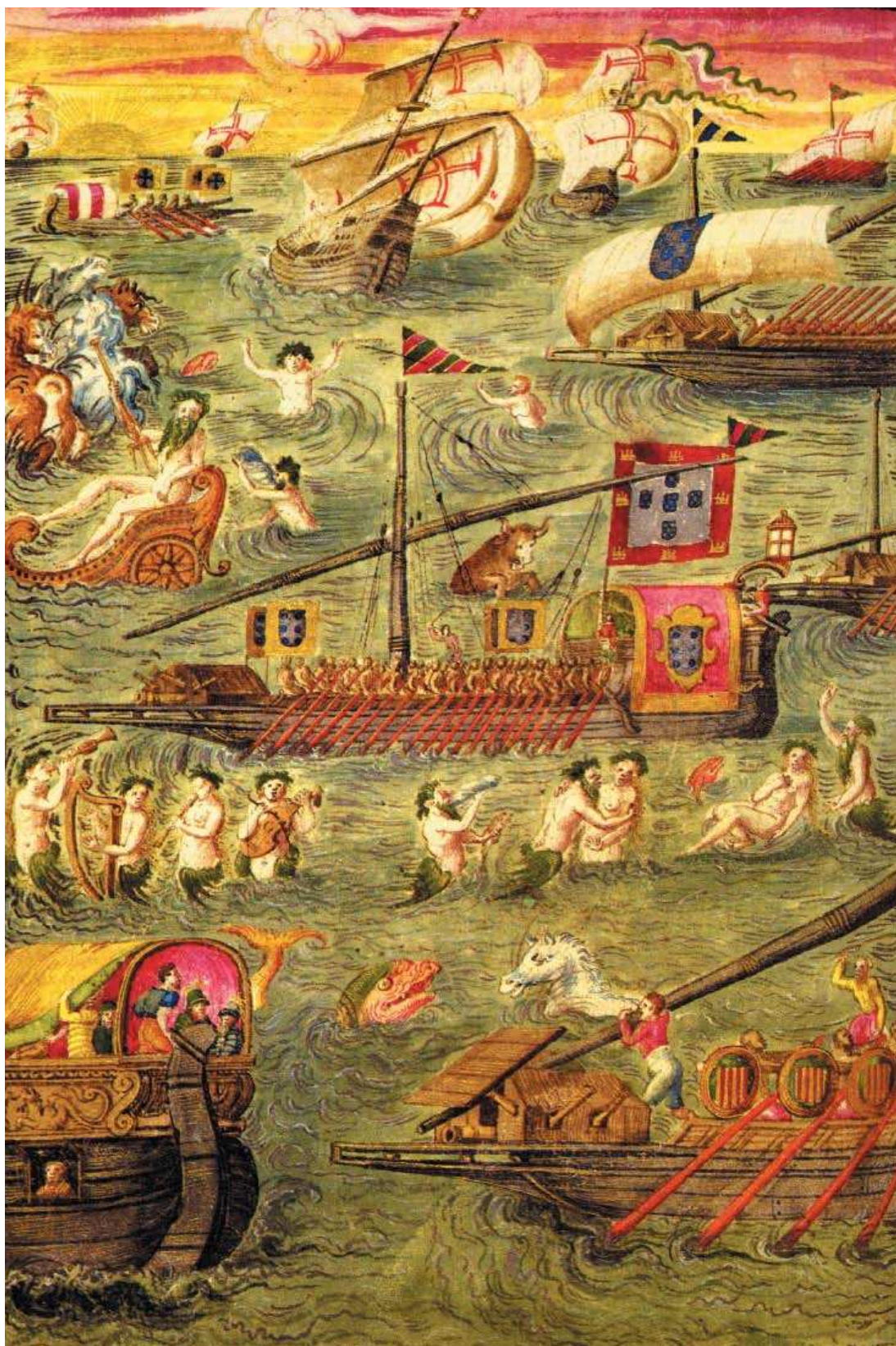


Plate in *Sucesso do Segundo Cerco de Diu*, by Jerónimo Corte-Real, Lisbon, 1574.

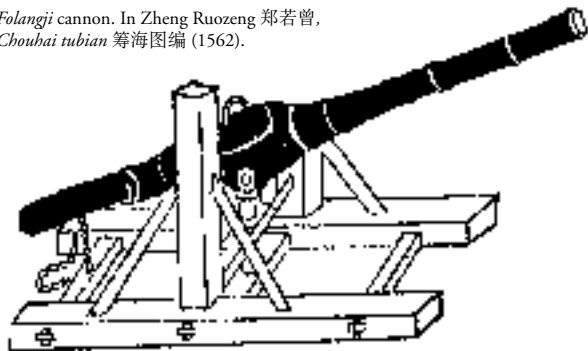
WEAPONS, FORTS AND MILITARY STRATEGIES IN EAST ASIA – I

two flanks, eventually encircling them. The engagement seems to have lasted from morning, when “the sun was one lance high,” to noon, by which time the Lodi forces were in complete disarray. Sultan Ibrahim had apparently been killed, though Babur was unaware of this fact until later. His account does not suggest that firearms entirely determined the outcome: the place of firearms seems relatively limited here when compared to accounts of the Battle of Chaldiran a decade earlier. Instead the main contest at Panipat pitted Mughal archers and cavalry against a Lodi force that relied in good measure on the use of elephants as the core of the battle array. Indeed, at one point in the text, Babur even suggests that the key to winning the battle was logistics. Sultan Ibrahim Lodi had the advantage both of the knowledge of the terrain and vastly superior fiscal resources. He could, therefore, have put a vastly larger army on the field had he been so minded and simply crushed the Mughals using mercenary troops (the term used is *ba dhandi*, from the Hindi word *dhandha*, meaning “trade” or “business”). “Thank God,” writes the Timurid prince, “he was able neither to satisfy warriors nor to part with his treasury.” The Sultan’s alleged “miserliness” may be translated as an underestimation of the Mughal force, but the underlying suggestion is also that he did not have the acumen to use his fiscal superiority to good effect.

Nevertheless, it seems significant that Babur mentioned the deeds of two of his firearms specialists by name during the battle, along with a whole host of cavalry commanders. One of the specialists was a certain Mustafa Rumi (meaning “from Rum” as Constantinople was known in the Muslim world), very probably a former Ottoman subject, who appears for the first time in Babur’s account of Panipat. He

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Folangji cannon. In Zheng Ruozeng 郑若曾, *Chouhai tubian* 筹海图编 (1562).



also appears later in the text on several occasions. In February 1527, Babur notes that at an engagement with the Rajput prince Rana Sanga, Mustafa Rumi used similar tactics as in Panipat, namely securing carts by chains “in the Anatolian fashion” (here in place of the ropes used at Panipat). Babur also suggests that tensions existed between Mustafa and his other artilleryman Ustad (or Master) ‘Ali Quli, so they had to be placed in separate parts of the battle formation. Each played a distinct role. In the Battle of Khanua in March 1527, he writes of how “Mustafa Rumi brought forward the caissons, and with matchlocks and mortars broke not only the ranks of the infidel [Rajput] army but their hearts as well.” In the attack on Kannauj in February 1528, both Mustafa Rumi and Ustad ‘Ali Quli are mentioned as playing a significant role, with the former taking the artillery down to an island in the river to fire on the town. Further east, in the course of Babur’s campaigns in Bihar, the two continued to play a part in Mughal attacks, including the sinking of enemy ships on the river Ganges.

Although Mustafa Rumi and his matchlockmen and lighter artillery only appeared from 1526, Ustad ‘Ali Quli was associated with Babur already from 1519, and is portrayed as both a specialist in the use of heavy cannon and an expert cannon-founder, hence the honorific of “Ustad.” In October 1526, some months after the Battle of Panipat, Babur describes his activities as a founder of cannon thus:

Ustad ‘Ali Quli was ordered to cast a large mortar to be used on Bayana and some of the other fortresses that had not yet entered our domain. When he had the smelting furnace and all the implements ready, he sent someone to inform me. On Monday, the 15th of Muharram [October 22] we went to watch Ustad ‘Ali Quli cast the mortar. Around the place where it was to be cast he had constructed eight smelting furnaces and had already melted the metal. From the bottom of each furnace he had made a channel straight to the mortar mould. Just as we got there he was opening the holes in the furnaces. The molten metal was pouring like water into the mould, but after a while, before the mould was filled, one by one the streams of molten metal coming from the furnaces stopped. There was some flaw either in the furnace or in the metal. Ustad ‘Ali Quli went into a strange depression and was about to

ARMAS, FORTALEZAS E ESTRATÉGIAS MILITARES NO SUDESTE ASIÁTICO – I

throw himself into the mould of molten bronze, but I soothed him, gave him a robe of honour, and got him out of his black mood. A day or two later, when the mould had cooled, they opened it, and Ustad 'Ali Quli sent someone to announce with glee that the shaft was flawless. It was easy to attach the powder chamber. He took out the shaft and assigned some men to fix it, and got to work connecting the chamber.¹³

This may have been the cannon nicknamed "Ghazi," which Babur refers to later in the text. At their most efficient, Ustad 'Ali Quli's cannons seem to have fired about sixteen rounds a day during sieges but this was rare. Another cannon he founded is reported to have "shattered the first time it was fired" in the attack on Kannauj.¹⁴

In the decade following Panipat, the use of firearms apparently became commonplace amongst the armies of northern India. Babur's son Humayun continued to use them in his armies, probably aided by the continued flow of military specialists into his domains from Central and West Asia. His principal rivals, the Afghans, did not lag behind. Mughal sources report that, after the defeat of the Lodis, Sher Shah Sur (the principal Afghan warlord in eastern India) used both the *zarb-zan* and the *dig*. After obtaining considerable success, and driving Humayun into exile in Iran, Sher Shah was ironically killed by his own cannon, one of which exploded while he was supervising the siege of the fort of Kalinjar in 1545.¹⁵ Few rulers in northern India in the first half of the 16th century seem to have resisted the use of firearms, while many actively welcomed them. As Jos Gommans observed in his survey of Mughal warfare "it appears that all the armies concerned principally adopted light artillery, which goes against the cliché that oriental powers had an irrational preference for heavy pieces."¹⁶

The same might be said about warfare in the Deccan, where, although far less scholarly work exists, firearms had clearly become widespread by 1520. One of the earliest instances of their use in the region comes from the Battle of Raichur, which pitted the Vijayanagara forces of Krishnadevaraya (or Krishna Raya) against those of the ruler of Bijapur, Isma'il 'Adil Khan. Two sets of sources are available to us for this engagement: those of near-contemporary Portuguese writers, and retrospective Indo-Persian narrative accounts and chronicles.¹⁷ Both suggest that

the engagement was of a rather different order than the Battle of Panipat, since it did not result in a wide-ranging conquest but in a relatively subtle shift of frontier. Further, the situation was one of a mixed siege-cum-battle rather than simply a field engagement. The circumstances leading to the engagement seem to have been as follows: Raichur's earlier medieval fortifications had been greatly strengthened in the late 1460s by the Bahmani sultans, who built a new moat, several bastions and gates to complement the older structure. As the Sultanate disintegrated in the late 15th century, the town came under the control of a certain Yusuf 'Adil Khan and his successors, who founded the Sultanate of Bijapur (and under whose control Goa fell at the time of the Portuguese conquest in 1510).

The "Military Revolution Thesis" argues that European overseas expansion and conquest did not take place through either general moral or material superiority, or through demographic or climatic pressure, but rather because the Europeans' military and naval advantage often made such expansion both possible and profitable.

In the first half of 1520, in circumstances that remain obscure, Krishnadevaraya decided to mount an attack on this fortified town and moved a substantial force there. Since he apparently did not possess firepower, the Vijayanagara ruler is reported by the Portuguese writer Fernão Nunes to have resorted to older techniques to break down the fortress walls. This might have led nowhere, except for a major miscalculation on the part of the Bijapur Sultan Isma'il.

WEAPONS, FORTS AND MILITARY STRATEGIES IN EAST ASIA – I

Apparently made overconfident by his access to firearms, which included at least four hundred heavier pieces of artillery (*tiros grossos d'artelharria*) and several hundred smaller ones, the Sultan decided to engage the besieging force in a pitched battle. This time, unlike Panipat, the side with the artillery lost. The Vijayanagara cavalry resisted and eventually drove the Bijapur force into the river, with major losses of men and animals. The Vijayanagara ruler was now able to return to the siege, this time helped by a small auxiliary force of Portuguese sharpshooters, armed with matchlocks (*espingardas*), and led by a mercenary named Cristóvão de Figueiredo. The Europeans eventually sapped the morale of the defenders when they not only picked off a number of men on the battlements but killed the governor of the city with a well-aimed shot.

At Raichur, then, firearms did play a role, but it was an unexpected one. The Bijapur field artillery proved ineffective, as did the artillery mounted on the walls of the fortress. Only the small arms played a role of some significance. Analyzing the materials on this battle, Richard Eaton recently concludes the following:

States usually assimilate new technologies by a gradual process of trial-and-error, in respect to which failures can be as important as successes. It seems certain that a principal cause of Isma'il's crushing defeat by the banks of the Krishna river lay in his gunners' inability to quickly reload and fire successive rounds of shot before being overwhelmed by Vijayanagara's swift and powerful cavalry.... From this point of view, Isma'il 'Adil Khan's defeat represented a crucial and necessary step towards the full integration of field cannon into South Asian military traditions that theretofore had been dominated by the use of heavy cavalry.¹⁸

Eaton is also undoubtedly correct when he points to the complex double origin of the firearms in use in the Deccan by 1520. Following the earlier work of the amateur scholar Rainer Daehnhardt, he posits a fusion between "a tradition of German and Bohemian gun making that had been brought to India by the Portuguese" with the Mamluk and Ottoman traditions, which the Portuguese often referred to in generic terms as the tradition of the *rumes* (men from Rum, the Ottoman capital).¹⁹ Some of these *rumes* may have been survivors of the defeated fleet of the Mamluk

admiral Amir Husain at Diu in 1509 (others from that force almost certainly found their way into the employ of a variety of patrons in Gujarat itself.) Until his death in 1522, Malik Ayaz, the governor of Diu, continued to employ so many men from the eastern Mediterranean that a part of Diu was known in the 1520s to the Portuguese as the *Vila dos Rumes*.²⁰ Although later accounts, like that of Gaspar Correia, have often exaggerated the overall military strength and dependence of Sultan Bahadur of Gujarat (r. 1526-1537) on imported firearms, it is clear that the sultan's expansionary politics in the late 1520s and early 1530s were based in some measure on his access to both European renegades and former Ottoman subjects who had entered his forces, of whom the most celebrated was Khwaja Safar-us-Salmani, also known as Khudawand Khan Rumi.²¹

III

The arrival of the Portuguese in the Indian Ocean with their armed vessels about 1500 had already made firearms an important feature in naval warfare there. When the Portuguese commander Pedro Álvares Cabral bombarded the port of Calicut in 1500, he was not met by a real counter-volley; when Vasco da Gama attacked the same town, two years later, he encountered a stockade of palm trees as well as a few artillery pieces, but the Portuguese easily overcame them.²² It was much the same story at sea. The *Instructions* provided in 1500 by the king of Portugal to Cabral, who was being dispatched to the Indian Ocean specified that, upon meeting any hostile ships, "you are not to come to close quarters with them if you can avoid it, but only with your artillery are you to compel them to strike sail ... so that this war may be waged with greater safety, and so that less loss may result to the people of your ships."²³ The precision of the orders suggests that the tactics described were not new in 1500. In any case, they came into immediate use: from now on, Portuguese fleets overseas normally deployed in line ahead and battered their enemies without boarding. Thus in 1502 a squadron of five caravels, three carracks, and ten smaller merchantmen met with an Indian fleet of some twenty large and seventy small ships off the Malabar Coast. The Indians, encouraged by their numerical superiority, closed for battle, whereupon the Portuguese commander Vicente Sodré

ARMAS, FORTALEZAS E ESTRATÉGIAS MILITARES NO SUDESTE ASIÁTICO – I

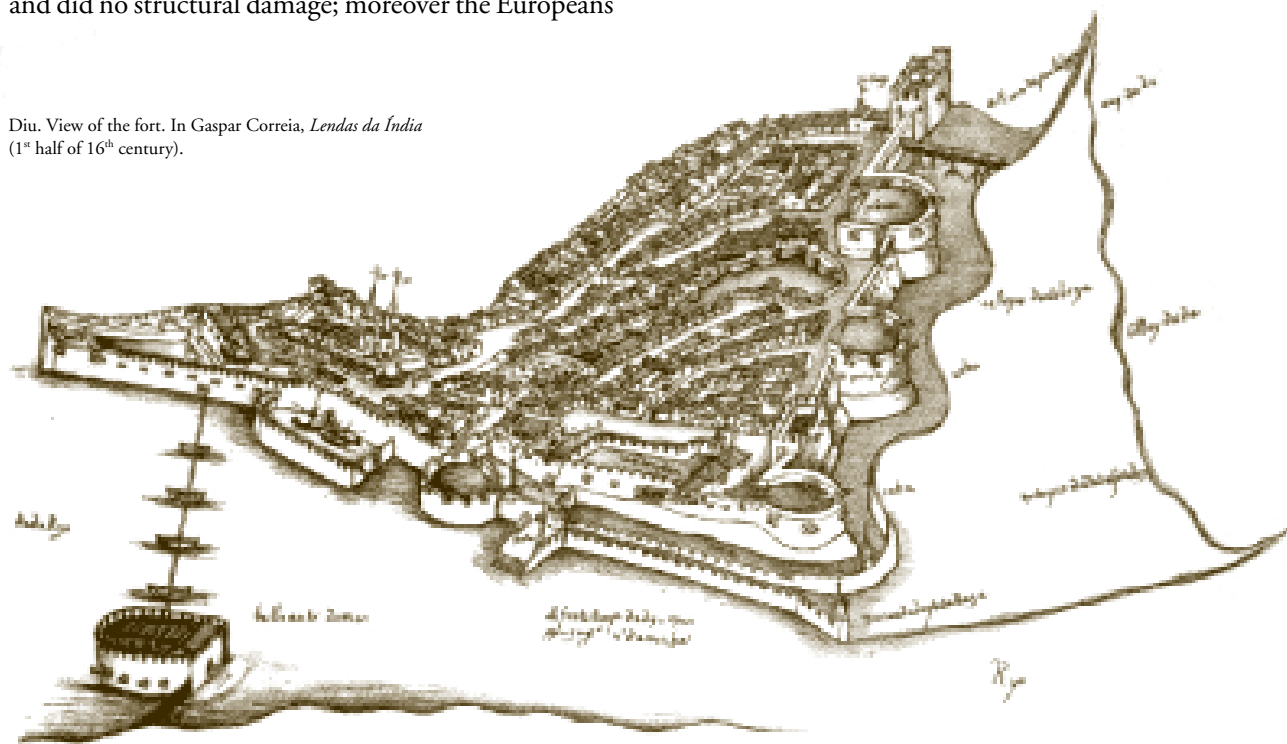
ordered the caravels to come one astern of the other in a line and to run under all the sail they could carry, firing their artillery as much as they could, and he did the same with the carracks to their rear. Each of the caravels carried thirty men, with four heavy guns below, and six falcons above (two of them firing astern), and ten breech-loaders placed on the quarter deck and in the bows. The carracks carried six guns on each side below, with two smaller ones at the poop and the prow, and eight falcons and many smaller breech-loaders on deck, with two smaller guns that fired forward.

As they sailed among the fleet from Kerala, each vessel fired its broadside and “made haste to load again, charging the guns with bags of powder which they had measured out ready for this purpose so that they could load again very rapidly.” Then, “having passed through, they turned about” and did the same again, their big guns aimed at the waterline, while the smaller ones concentrated on the masts, the rigging and the people thronging the decks. Several enemy vessels sank, others suffered extensive damage, and the loss of life was appalling. But the Portuguese emerged more or less unscathed for, although the Indian ships “fired the many guns that they carried, they were all small,” and did no structural damage; moreover the Europeans

kept mainly below the decks, so that neither bullets nor arrows harmed them. The shattered remnants of the Kerala fleet fled.²⁴

Just a few years later, however, the Portuguese faced other maritime forces that were quite adept in the use of firearms, largely on account of contacts between West Asia and western India. A celebrated instance of this was the battle of Chaul in early March 1508, when a fleet combining a core Mamluk force from Egypt led by Amir Husain Mushrif al-Kurdi from the Red Sea, with auxiliaries from Diu in Gujarat led by Malik Ayaz, and some Mappila vessels from Kerala, dealt a dramatic defeat to a Portuguese fleet led by Dom Lourenço de Almeida, son of the viceroy. Descriptions of the battle reveal that the fleet that confronted the Portuguese comprised largely galleys and smaller vessels (*fustas* and *atalaias*), but armed with artillery (*artelharia*) that was used to good effect. To be sure, both fleets seem to have preferred close combat, attempting to grapple and board each other's vessels, but at least one important contemporary account makes it clear that the Portuguese were greatly disadvantaged as they lacked supplies of gunpowder (*a pólvora falecia aos nossos*). The same account even asserts that the *coup de grâce* to the vessel of Dom Lourenço was eventually delivered by

Diu. View of the fort. In Gaspar Correia, *Lendas da Índia* (1st half of 16th century).



WEAPONS, FORTS AND MILITARY STRATEGIES IN EAST ASIA – I

Malik Ayaz's men using a "great bombard (*bombarda grossa*) which made a hole in the nau at the waterline, on account of which it went down to the bottom."²⁵

It continues to be a matter of some debate as to whether the Battle of Chaul was a flash in the pan, or a measure of the fact that not much separated the Portuguese and their opponents in the Indian Ocean by this time in matters of military technology. An argument that is sometimes used in favour of the former view is the defeat that a Portuguese fleet under the viceroy inflicted on the same Mamluk-led force the next year in February 1509 in the waters off Diu. Some accounts portray this as a matter of Mamluk incompetence in matters pertaining to firearms; a Portuguese historian has also claimed that the problem lay in the fact that "the Mamluks above all formed a body of horsemen without any experience of naval combat; they did not possess a body of well-trained mariners."²⁶ A close reading of contemporary sources suggests, however, that the real problem was not technical but tactical; the Mamluks were abandoned by their allies from Diu, who left them in a vulnerable situation to be picked off by the Portuguese fleet.²⁷ Further, evidence from the following decade suggests that maritime entrepreneurs in western India often managed to adapt to the new conditions by using firearms on their vessels; this was certainly the case with the Mappila Muslims of the ports of Kerala, who continued their extensive trade with the Maldives, Gujarat, and even the Red Sea and South Arabia defying all Portuguese attempts to prevent them.

Adaptation was soon to be found as much on the coastal plain as on the water. Two years after the Battle of Chaul, the siege of Goa conducted by Governor Afonso de Albuquerque saw artillery being used by both attackers and defenders. The exact nature of Goa's fortifications in October-November 1510, when Albuquerque made his definitive second attack, is unclear, as is the extent to which renegade Europeans participated in defending the town from the Portuguese; but firearms were extensively used—indeed the Portuguese recovered many guns after they captured the town.

The port-cities and states of western India thus resorted increasingly to firearms between 1500 and 1520 thanks to a variety of influences:

- the presence of the Portuguese as well as renegades from the Portuguese enterprise who went over to their opponents;

- links to the powers of West Asia and the circulation of military specialists from the eastern Mediterranean in the sultanates of the Deccan and Gujarat;
- indigenous innovation in areas such as Bijapur to produce iron and copper ordnance.

The last of these factors is attested by the Portuguese viceroy Dom Francisco de Almeida himself, who cautioned King Manuel not to devote too many of his resources to preventing connections between the Red Sea and western India. "It would profit you little," he informed the king,

if [your fleets] were to reach Tur [in the Red Sea] while here [in India] your cargo ships are seized and your fortresses destroyed. If you are told that by going on the open sea, one can stop a [Mamluk] fleet from arriving here, the Venetians and the Sultan's people are in Diu, constructing the ships and the galleys that we have to combat, where there is all the abundance of wood ... and a great quantity of metal for artillery and most perfect artisans.²⁸

His successor, Albuquerque, for his part, told the king in 1513 that artillery, bombards and matchlocks (*bombardas e espingardas*) were now "better produced from iron in Goa than in Germany."²⁹

Accounts of the mid-16th century in South Asia mention firearms in the context of battles, sieges and naval actions alike as a commonplace, so we have come some distance from the situation in the early 1500s. Occasionally, we encounter an explicit expression of ambiguity in respect of these new-fangled weapons, as in the account by the shipwrecked Ottoman admiral, Seydi 'Ali Re'is of his travels in Sind in the 1550s. On his arrival in the area, the admiral found himself embroiled in a dispute between the ruler of the region, Shah Hasan Mirza, and his rival 'Isa Tarkhan, ruler of Thatta. The latter, it turned out, had decided of late to have the *khutba* read out and the ceremonial drums (*naqqara*) sounded in the name of the Mughal ruler, Humayun (son of Babur), who after a period of exile in Iran had now returned to rule northern India. Shah Hasan wanted a stop put to this, and in order to enlist the support of his Ottoman visitors, offered Seydi 'Ali the governorship of Lahori Bandar, as well as robes of honour for this entourage.

There were various reasons for welcoming the Ottoman party, but one of these was that it was clearly

ARMAS, FORTALEZAS E ESTRATÉGIAS MILITARES NO SUDESTE ASIÁTICO – I

believed that Ottoman subjects were particularly proficient in the use of firearms. So it was that Seydi 'Ali came to be placed in charge of a battery that was aimed at forcing Mirza 'Isa, who was under siege, to surrender, but the cannonade proved ineffective. Seydi 'Ali implies that the fighting was not conducted very seriously since the two parties—the Arghuns and Tarkhans—were in fact closely connected with each other. He even claims that Shah Hasan told him: “Do not attack the Muslims, and make sure that there are no balls in your muskets, for all of us are one people! The greater part of our brothers and our children are over there [in Thatta].”³⁰ Obviously, in this situation, all-out war using firearms was not an option, and so the end result was a compromise between the two parties, which Seydi 'Ali claims eventually to have mediated.

The expansionary campaigns in northern, eastern and central India of Humayun's son and successor,

The arrival of the Portuguese in the Indian Ocean with their armed vessels about 1500 had already made firearms an important feature in naval warfare there.

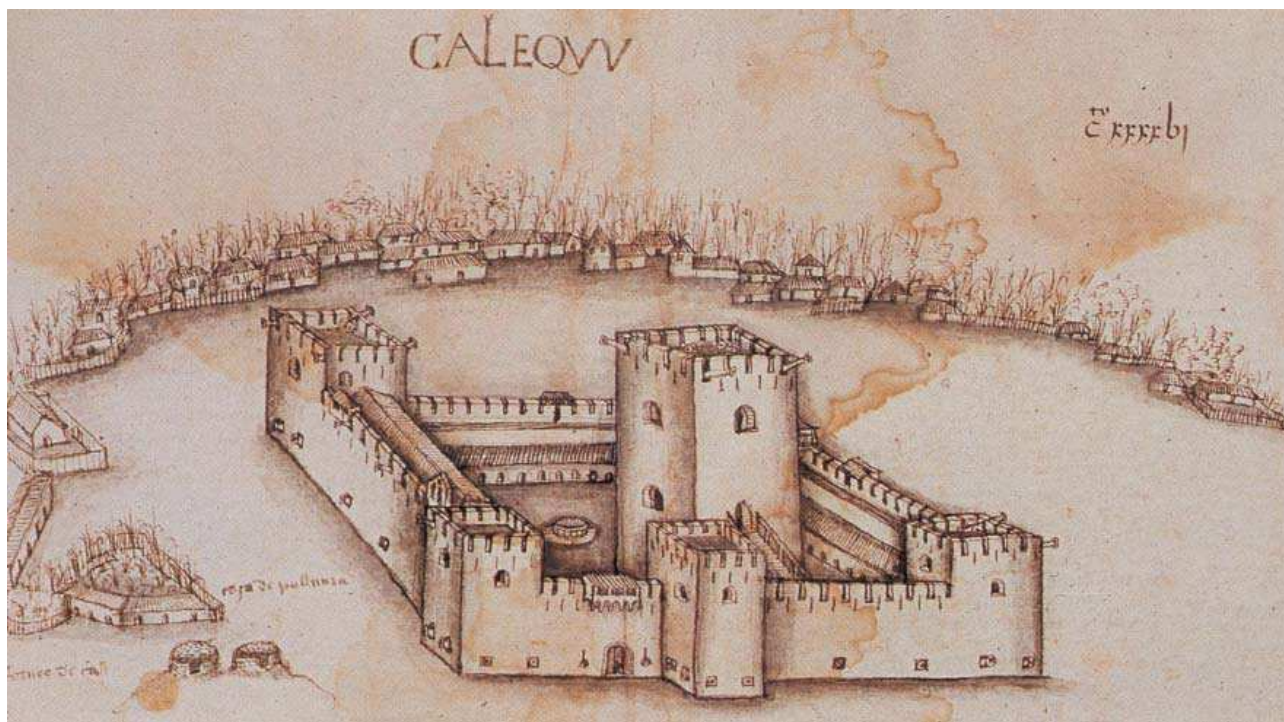
Akbar, also seem to have made regular use of firearms, although not necessarily in a decisive way. Heavy cavalry remained central to the Mughal way of war; and the huge hill-fortresses of the subcontinent were rarely vulnerable to cannon-fire alone. The greatest diffusion of guns in India occurred with hand-held firearms, the quality and quantity of which often drew praise even from otherwise sceptical European observers. Thus an English merchant travelling in the Ganges valley in the 1630s noticed “labourers with their guns, swords and bucklers lying by them while they ploughed the ground.”³¹ These firearms, known by names such as *banduq* and *tufang*, can be found as much inside the Mughal domains as on their fringes and in southern India; by the close of the 16th century, they were often associated with specific ethnic groups deemed specialists in their manipulation, such as the Baksariyas, the Bhils

and the Bedas.³² Even a petty chieftain in South India, in the region of Madras, can be seen in the 1580s to surround himself with small arms; an Italian visitor to the region describes such a chief as always “setting out, accompanied by many harquebusiers on foot, who go about completely naked save for their private parts and are armed with harquebuses with the ammunition belts (*caricature*) slung across their flanks.”³³

These indigenous specialists apart, evidence from the 16th century suggests that all across South Asia, gun-wielding “Turks” (or *rumes*) and European renegades frequently rubbed shoulders. At the capture of Goa in 1510, for example, an Italian participant reported that the victors “killed around two thousand persons of those who resisted us. And these were almost all Turks, and renegade Christians of all sorts; among whom were Venetians and Genoese in largest numbers.”³⁴ In spite of this salutary example, the total of “renegade” Christians who earned their living from local rulers in the region continued to rise—to perhaps 5,000 by 1600—with an even larger number of *rumes*. Their presence may have dwindled somewhat in the course of the 17th century, at least in Mughal India, and their rewards diminished as native artificers became more experienced; nevertheless, during the civil war between Aurangzeb and his brothers for the Mughal throne in the late 1650s, several hundred Europeans and *rumes* served both as mercenaries and as technical advisers, especially for artillery and siege-craft. Thus, according to the French physician François Bernier, in the course of the war of succession, Aurangzeb captured the port-city of Surat in 1658 only because some Dutch experts “showed his generals how to use gunpowder mines.”³⁵

The fort at Surat had in fact been constructed in the mid-16th century by none other than that former Ottoman subject, Khudawand Khan Rumi; but in general, Indian rulers seem to have taken few steps to imitate European or even Ottoman fortification styles. According to Nicolò Manucci, an Italian adventurer of the 17th century, the newly-constructed Mughal capital at Shahjahanabad-Delhi (which was built from 1638 on) boasted walls in the 1650s “one half of brick and the rest of stone. At every hundred paces is a strengthening bastion, but on these there is no artillery.” Some decades earlier, William Methwold of the English East India Company reported that the Deccan state of Golconda (to the east of Bijapur) possessed sixty-six

WEAPONS, FORTS AND MILITARY STRATEGIES IN EAST ASIA – I



Calicut. View of the fort. In Gaspar Correia, *Lendas da Índia* (1st half of 16th century).

fortresses, most of them perched on high rocks or hills and accessible by only one route. Most were of massive construction: the walls of Dinpanah or the Old Fort (*qil'a-i kuhna*) at Delhi, built between 1530 and 1545 by Humayun and Sher Shah, stood some fifty feet thick and sixty feet high; those of Golconda, four miles in circumference and later adapted to include artillery platforms, were no less imposing. Against such targets, even the heaviest early modern artillery bombardment (supposing siege guns could be brought up) made little impression, and sieges tended to be decided by blockade rather than cannonade. Thus Aurangzeb brought about 100 siege guns and 100,000 troops against Golconda in 1687, and also set three mines (each containing sixteen tons of gunpowder) under the walls; but the guns never came close enough to be effective, and when the mines were sprung two had been counter-mined and blew back on the attackers while the third failed to ignite. In the end, after an eight-month siege, Golconda only fell by treachery when a disaffected nobleman 'Abdullah Khan Panni opened one of the gates to the Mughals during a night attack.³⁶

The proliferation of firearms thus did not translate necessarily into real influence. The thesis of

a limited role played by firearms in the expansion of Mughal power which much of the newer historiography seems to support, flies somewhat in the face of an older characterization of the Mughals by Marshall Hodgson and others as a "Gunpowder Empire."³⁷ In his recent survey of Mughal warfare, Jos Gommans reaches rather cautious conclusions, wishing to downplay the dramatic effects of firearms: for him, there was simply no "radical change" visible in the architecture of fortresses in view of "the rather slowly improving gunpowder devices"; even though small arms and cannon were "widely available on the Indian sub-continent," their effect was limited in the 16th and 17th centuries. It was only occasionally that "cannon would decide the outcome of a siege or a battle"; all in all, "in tactical terms, firearms served best in a defensive situation behind cover, facilitating the flanking operations of the cavalry [as] ... they merely replaced the elephants and the heavy cavalry in the centre at earlier battles."³⁸

This conclusion about the Mughals, while it corresponds in some measure to a similar view that some authors have put forward regarding the Safavids, diverges quite considerably from the received wisdom

ARMAS, FORTALEZAS E ESTRATÉGIAS MILITARES NO SUDESTE ASIÁTICO – I

regarding the Ottomans.³⁹ The differences between the Ottoman and the Mughal cases may lie, in part, in the fact that the military competition between the Mughals and European powers in the 16th and 17th centuries was in fact rather limited. No European armies took the field against the Mughals until the 18th century, and the few engagements which the Mughals fought directly against the Portuguese, such as the siege of Hughli in 1632, resulted in a triumph for the former.⁴⁰ On the other hand, the geometrical artillery fortresses constructed on the South Asian mainland by the Europeans usually withstood attack from local forces. In any event, the point is that Mughal-European competition was not a significant motor for change in military technology and tactics in South Asia before 1700; rather it was inter-state competition within South Asia, with European (and Ottoman) firearms available as a technological means. In contrast, the Ottomans fought wars on at least two fronts: against rival states in the Islamic world such as the Mamluks and the Safavids, and against European opponents such as the Habsburgs. Far more than the Mughals, they were obliged to keep up with, respond to, and deflect changes that came from the West. This can be used as an explanation for changes in the use of volley fire by Ottoman janissaries in the context of the so-called “Long War” with the Habsburgs of 1593-1606; recent research suggests that the Ottomans reacted to, and may even have improved upon, European techniques very quickly indeed.⁴¹

The situation farther east, beyond the Bay of Bengal, presents important variations to this picture. Less than a year after his successful final attack on Goa, the Portuguese governor Afonso de Albuquerque brought a fleet to the Malay Peninsula to attack the great trading centre of Melaka, the seat of a Sultanate and the hub of a vast trading network. Melaka in 1511 was a huge trading metropolis, with a waterfront said to measure nine miles and a population that exceeded 100,000, but it lacked regular fortifications. Moreover, it was stated by contemporaries that “most of its artillery—such as it has—resembles muskets,” and “they are very short of gunners and powder.”⁴² When the Portuguese expeditionary force arrived, the Sultan of Melaka, Mahmud Syah, “greatly fortified the seaboard with stockades of huge thick trees full of numerous cannon large and small and cases crammed with gunpowder.” Albuquerque proceeded to burn

a few ships off the port in order to secure from the Sultan a favorable agreement, which included the demand that the ruler “should send people to a place that he would tell him of to build a fortress at his own expense.”⁴³ Since these terms were contemptuously dismissed, Albuquerque at first tried to capture Melaka by naval bombardment (bringing to bear, according to one source, 400 guns).⁴⁴ When this failed, the 1,500 Portuguese, plus their 800 allies (Chinese and Indian), stormed the stockade and the inhabitants fled.

Now, having gained a lodgment, Albuquerque (so it is reported):

with great haste by day, and the use of torches by night, was intent on building a castle of timber, with many large trees for the interior and a goodly quantity of cannon, and in a month it had been made strong; and as soon as it had been made secure, we prepared one of stone which we built by dismantling the houses of the Moors, the mosques and other of their buildings. We erected it with great hardship bearing the stones on our backs; and each one of us was day-labourer, mason and stone-cutter.⁴⁵

The work endured, and this castle, known as *A Famosa* still formed part of the defenses of the city 130 years later when, despite a complete circuit of walls constructed in the 1560s which had resisted numerous sieges by its Asian neighbors, it eventually fell to the Dutch East India Company.

Fortifications built in the vertical style, like *A Famosa*, or with hollow round towers (like the walls of Melaka) proved perfectly adequate against most local rulers. Admittedly, improvements became advisable from time to time. As early as 1513, Albuquerque complained that in western India, “the people we are fighting are different now, and [their] artillery, arms and fortresses have now all been transformed to our way of using them,” but the Europeans still seemed to retain a decisive advantage.⁴⁶

In 1511, when the Portuguese took Melaka, no other urban centre in Southeast Asia seems to have possessed stone walls, and the situation changed only slowly.⁴⁷ In Thailand, even in the late 17th century, only Bangkok had any walled defenses—a chain of small forts along the Chao Phraya River, manned by one hundred Christian Luso-Asian soldiers under captains “who drill them every day.” Elsewhere, according to European visitors, the Siamese disdained to fortify strong places

WEAPONS, FORTS AND MILITARY STRATEGIES IN EAST ASIA – I

“for fear of losing them, and not being able to retake them.”⁴⁸ Likewise, the early modern Vietnamese burnt their wooden settlements when invasion threatened, fleeing to the mountains until security returned. Despite an almost constant state of civil war in the country, the only permanent fortifications remained the walls built across central Vietnam to divide Tongkin from Cochin-China; towns and cities were surrounded at most by a bamboo fence (although Hue at least boasted a considerable stock of European-made artillery by the 1680s).⁴⁹

Only Burma proved different: the unification of the country by the Mons of Pegu in the mid-16th century clearly owed a lot to their ability to construct “impregnable” fortifications in the European manner, although this ability seems to have waned somewhat in the 17th century.⁵⁰

These mainland states, however, rarely faced a major and sustained European challenge: Filipe de Brito e Nicote and his motley crew of mercenaries in lower Burma (1599-1613) and Louis XIV’s naval and military expedition to Siam (1687-1688), although surprisingly successful, proved to be relatively isolated episodes.⁵¹ In the Indonesian archipelago, by contrast, once the Portuguese faced Spanish, Dutch, English, and French competitors, several port cities began to acquire walls. Some already boasted fortified residential compounds for the great men, and solid stone “godowns” (Malay *gudang*) in which merchants stored their goods against the threat of theft and fire; and by 1600 the Javanese cities of the *pasisir* (north coast) Banten, Jepara, Tuban, Pati, and Surabaya had all acquired perimeter walls. Nevertheless, the largest metropolis in the archipelago,

Bandar Aceh, rejected them: “This city [according to a chronicler] is not fortified like other cities because of the very large number of war elephants” able to protect it.⁵²

The sultans of Makassar in eastern Indonesia displayed rather more ambition. By the 1630s, their capital possessed a large fortress (named “Sombaopu”) around the royal palace, which, on the seaward side, boasted walls fourteen feet thick, and four bastions equipped with twenty heavy guns donated by

Europeans (the Danes, English, and Portuguese all maintained factories in the city) and commanded by an Englishman who had converted to Islam.⁵³ Other forts of brick also sprang up, until in the 1660s a solid defensive wall studded with forts stretched along the seafront of the city for over seven miles.⁵⁴ Both the design of the forts and contemporary documents indicate Portuguese influence, and this should come as no surprise: Makassar had been consistently friendly towards the Portuguese since the arrival of the Dutch in the area, and provided a crucial refuge for them as the Dutch noose tightened elsewhere. After the fall of Melaka in 1641, for example, between 2,000 and 3,000 Portuguese seem to have transferred their activities from Malaysia to

Makassar.⁵⁵ The Dutch resented this challenge, and in 1667 a fleet of thirty-five ships (including eleven warships) sailed up from Batavia and bombarded the forts along the seafront. Despite a barrage of “12, 18 and 24 pound balls from the enemy,” which damaged the masts, sails and rigging of the Dutch ships, the fortresses fell one by one, and eventually Makassar made peace. Two years later, however, when it seemed



A western-style cannon. From He Rubin 何汝賓, *Bing Lu* 兵錄, 1606.

ARMAS, FORTALEZAS E ESTRATÉGIAS MILITARES NO SUDESTE ASIÁTICO – I

that the Sultan had disregarded the agreement, the Dutch returned with Bugis allies and began a formal siege. In June 1669, after six months of bitter fighting, the Dutch managed to explode a mine under the walls of Sombaopu and create a breach twenty yards wide. They then launched an assault that involved fighting so heavy “that old soldiers have perhaps never heard its like in Europe itself.” The Dutch musketeers allegedly fired off 30,000 rounds, yet it still took ten days to complete the capture of the fort.⁵⁶

Part of the answer lay in the Rumis and renegades who made their influence felt in Makassar and all over the Islamic world. The Sultanate of Aceh in northern Sumatra, for example, established direct contact with the Ottoman Sultan Süleyman the Lawgiver (1520-1566); letters and gifts were exchanged, and a stream of Ottoman military experts came to Indonesia to cast cannon and to fight (according to some Malay

sources, some 300 Rumis with firearms fought for Aceh by 1537). In 1567 the Ottoman Sultan is said to have promised to send a fleet to Indonesia to drive out the Portuguese, but in the event it sailed to suppress a revolt in Yemen instead.⁵⁷ Sultan Iskandar Muda of Aceh (1607-1636) maintained a corps of military slaves, captured when young and trained especially (just like the Ottoman kul), and his soldiers constructed siege-works of such sophistication that (according to a Portuguese account) “not even the Romans could have made such works stronger or more quickly.”⁵⁸

IV

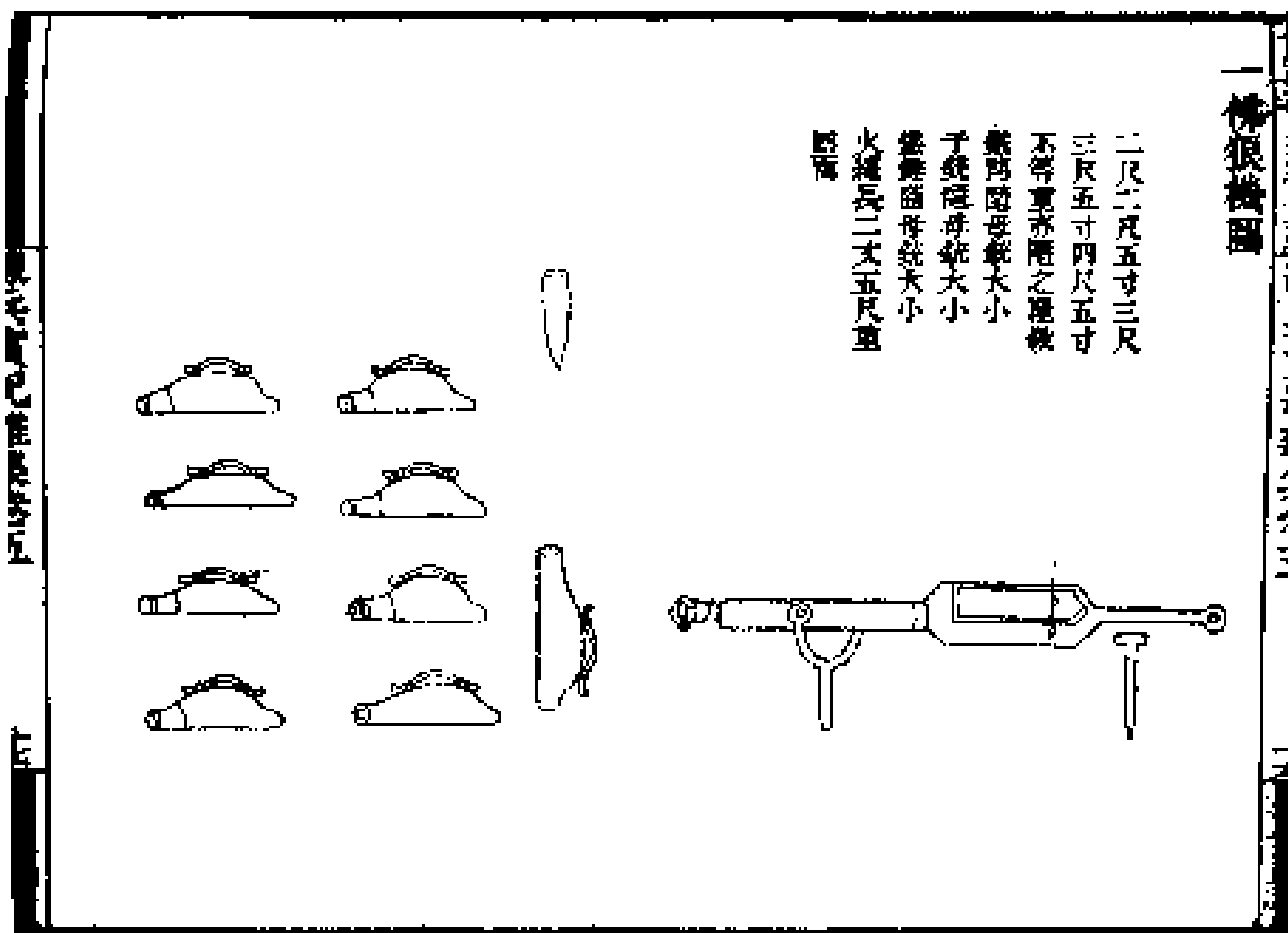
In East Asia, firearms, fortresses and standing armies had long been part of the military tradition of China, Korea and Japan; indeed, as already noted, both bronze and iron artillery were fully developed in China before the gunpowder revolution spread westwards to Europe. However, after the mid-14th century, contact between the Far East and the Far West diminished, and the subsequent evolution of firearms in the two areas took a somewhat different course. By 1500, the iron and bronze guns manufactured by Ottoman and Christian founders proved to be both more powerful and more mobile than those of the east, so when European adventurers brought them to East Asia, they attracted both attention and imitation. They may have arrived in China as early as the 1520s, perhaps with one of the numerous Ottoman diplomatic missions to the Central Kingdom; but, if so, knowledge of them seems to have remained confined to government circles. For most Chinese, European-style firearms were first encountered in the hands of the *wakō* (allegedly Japanese “pirates”) operating against Fujian in the late 1540s.

Guns were not greatly used by the Ming forces against the *wakō*, although we learn that in 1554 the governor of the maritime Zhejiang province “ordered the bronze bells in all the Buddhist monasteries in the region confiscated to be melted down for firearms, literally ‘Frankish machines’ (*folangji* 佛郎机).”⁵⁹ They were introduced shortly afterwards on the empire’s northern frontier against the nomads of the steppe. In 1564, for example, the Beijing garrison replaced their clay-cased cannonballs with lead; and in 1568 these too were abandoned in favour of iron. Then, in the 1570s, under the direction of Qi Jiguang 戚继光 (who had masterminded the defeat of the pirates), the Great Wall

Below and opposite: First Chinese depiction and description of the *folangji* and western weapons to appear in print.
In Zheng Ruozeng, *Chouhai tubian*.



WEAPONS, FORTS AND MILITARY STRATEGIES IN EAST ASIA – I



was rebuilt with pill-boxes to shelter musketeers, and the reserve units of the northern army were strengthened with small carts (known as “battle wagons”), each carrying breech-loading light artillery and served by twenty men. In 1562 Qi Jiguang also published *Jixiao Xinshu* 纪效新书 (A new treatise on disciplined service), an illustrated drill manual remarkably like the *Essentials of the military arts*, with sections on fighting methods, weapons, military encampments and marching formations as well as warships and formations for naval defense. Each contained descriptive block-prints. Qi intended the different sections to be read aloud to each unit by their intermediate commanders and then memorized by the troops. Five editions of the *New treatise* came out in the 16th century.⁶⁰

These innovations failed to impress European visitors. In 1584, for example, the devout but pragmatic Jesuit Matteo Ricci in China wrote scathingly of the pusillanimity of his hosts:

Because when two or three Japanese warships come and land on the coast of China, they burn their boats and capture villages and even large cities, putting everything to the torch and sack, without anyone offering resistance It is true that the Chinese have many fortresses, and the towns all have their walls with which to resist the fury of the pirates; but the walls are not of geometric design [i.e., they lacked provision for flanking defensive crossfire] nor do they have traverses or moats.⁶¹

Ricci perceived the absence of artillery fortresses—at least in coastal areas—as a critical weakness in China’s military effectiveness which, he felt, might facilitate European conquest and (his real objective) the Christianization of East Asia. Lacking bastions, he believed that the Ming Empire, for all its apparent strength, might crumble in the face of modest European pressure.⁶²

ARMAS, FORTALEZAS E ESTRATÉGIAS MILITARES NO SUDESTE ASIÁTICO – I

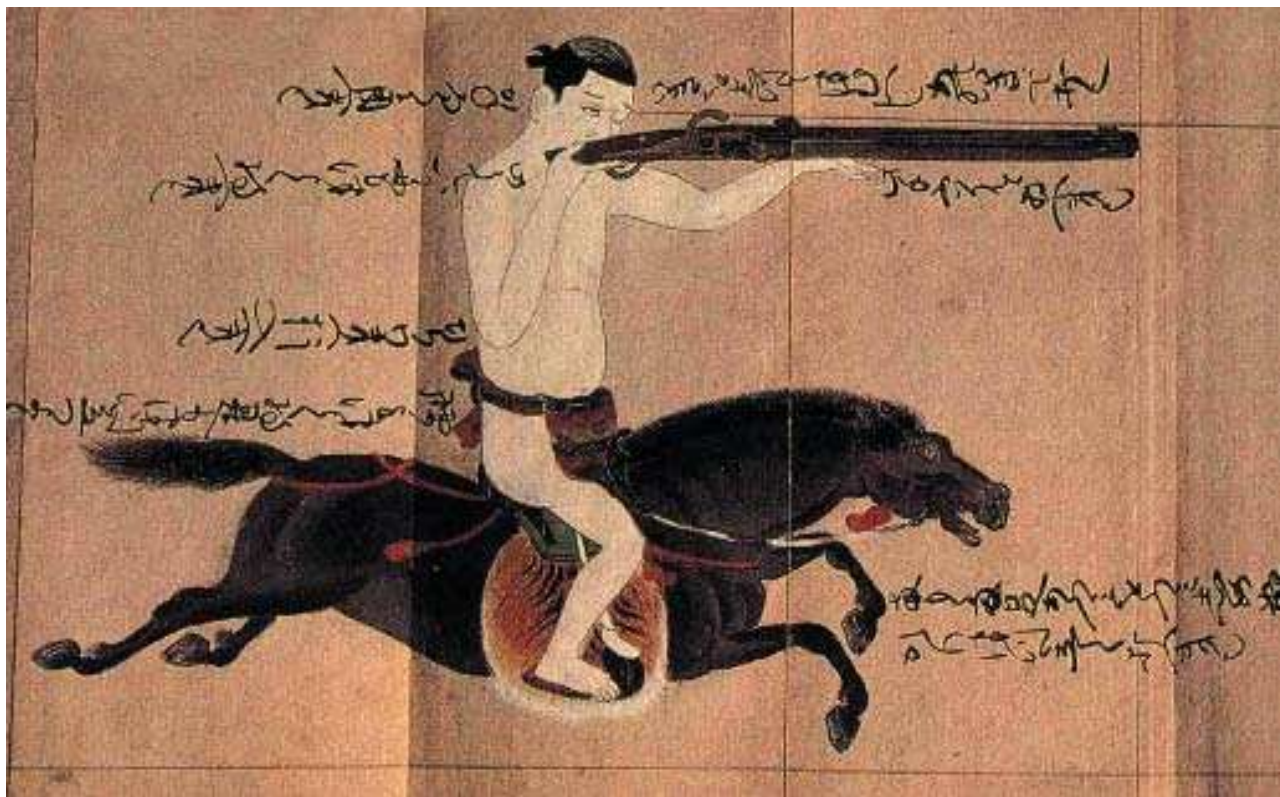
Forty years later a Spanish Jesuit, Adriano de las Cortes, who spent almost a year observing the drill of the local garrison troops in 1625, remarked that their firearms were “of little force and poorly made,” their powder of poor quality and their shot “no larger than tiny pellets of lead.” Moreover, “no soldier ever carries more than one weapon” (harquebus, pike or bow) and none ever carried a sword, “so that if their first shot misses, they have no other weapon with which to defend themselves.” Chinese drill, Las Cortes claimed, “resembled games more than preparing to fight well.”⁶³ A decade later, his Portuguese colleague Álvaro Semedo, after watching imperial troops undertake weapons drill with live ammunition, likewise compared “these exercises” with “the boys who, in Europe, pretend to be Moors and Christians.” The soldiers did not practise fighting, Semedo averred, but simply “waved their lances and swords as if they were in some stage play.”⁶⁴

Nevertheless, such “stage plays” involved high stakes. Father Las Cortes also described the extreme brutality of the officers, who made their soldiers

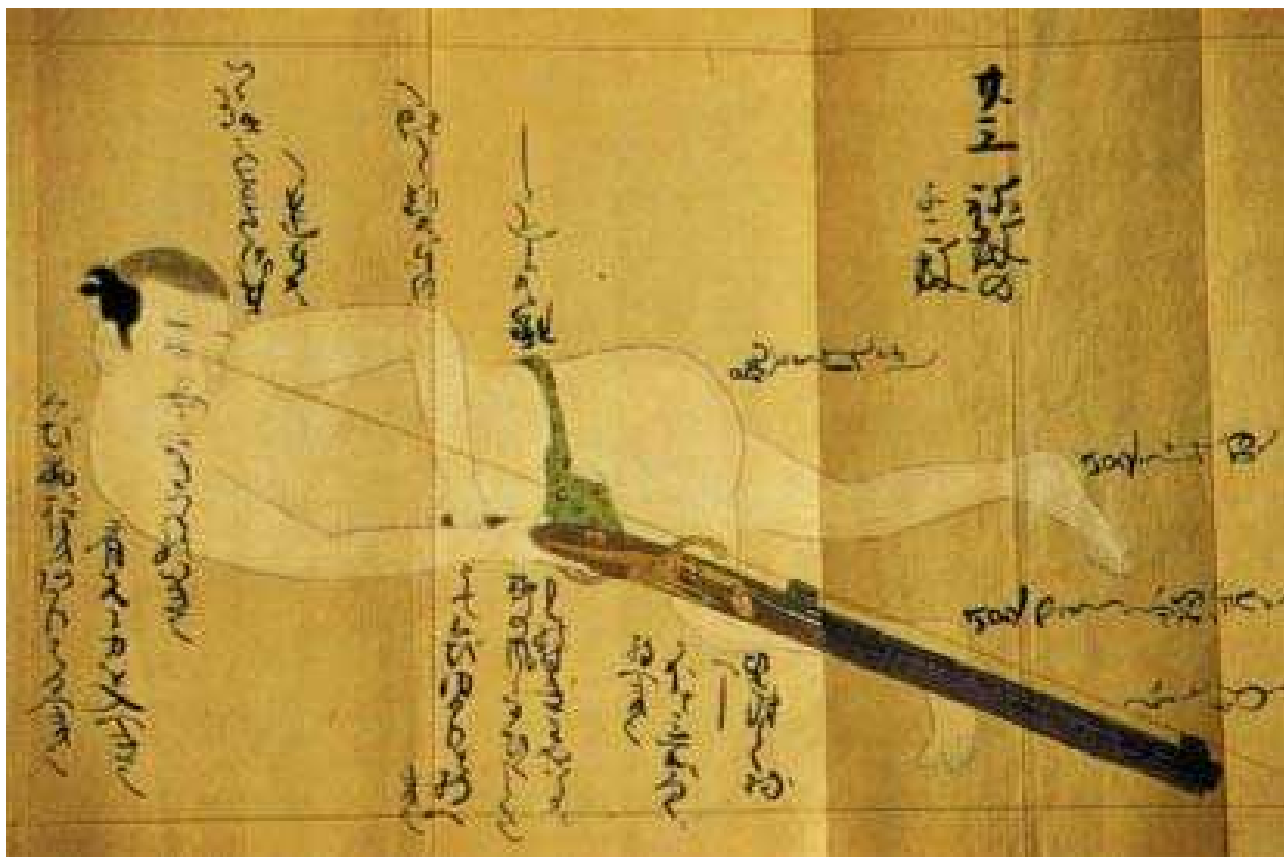
“drop their trousers and, lying on the ground as if they were schoolboys, to receive the number of blows” decreed—sometimes up to forty at a time, which left the recipient more dead than alive. He believed this explained why many soldiers, driven by hardship to enlist, deserted as soon as they had accumulated sufficient resources to do so. Other men mutinied. The *Ming Shilu* 明实录 (Veritable records of the Ming) and other sources recorded over fifty serious military revolts during the Chongzhen reign (1627-1644), reaching a crescendo during the last few years when pay for the troops fell far in arrears.⁶⁵

Although these Jesuits remained sceptical, the degree to which European weaponry had been adopted under the late Ming appears in the illustrated *Taizu Shilu* 太祖实录 (Veritable Records of the Great Ancestor) compiled in 1635 to record the deeds of Nurhaci, founder of the Qing dynasty. It is significant that in the pictures of the “Great Ancestor’s” early victories all the guns are on the side of the Ming: the Imperial armies are shown deploying field-guns, mounted either

Below and opposite: From *Sanjuni-so Ezu* (Book Illustrating Thirty-Two Positions), an Inadome Firearms School’s training manual, c. 1600. Courtesy of National Museum of Japanese History, Sakura.



WEAPONS, FORTS AND MILITARY STRATEGIES IN EAST ASIA – I



on trestles or on two-wheeled “battle wagons,” and the infantry carries muskets, while the northern warriors seem to rely on their bows. The historical record bears this out. When Nurhaci declared war on the Ming in 1618, his forces consisted almost entirely of mounted archers whereas his Chinese opponents relied mainly on infantry using firearms; so although the Manchus occupied large parts of Liaodong, its major towns defied them. In 1626, as Nurhaci led an assault on an artillery fortress, he received a fatal wound. An arms race now began between the Manchus and the Ming. The Chongzhen emperor summoned some 400 “experts” to bring European weaponry from the Portuguese enclave of Macao to the capital; but the merchants of Canton, fearful that the emperor might in gratitude enlarge the trading privileges of their foreign rivals, sabotaged the mission. Infuriated, some Ming officials (aided by a few Europeans) acquired European-style guns themselves: by 1630 about fifty of them defended the Great Wall.

The ability of a selfish civilian group to undermine the entire imperial system of defence, and of individual generals to cast their own cannon, contrasted strongly with the Manchu experience. During a raid into China in 1629 Hong Taiji 洪太极, who, after a brief succession struggle, followed his father Nurhaci as Manchu leader, acquired both European guns and a Chinese gun crew “familiar with the new techniques for casting Portuguese artillery.” He not only conscripted them but also offered huge enlistment incentives to anyone proficient in the art of making and using cannon who agreed to serve him: within two years he boasted forty new European-style artillery pieces and crews to work them. Evidently he also attracted some Chinese engineers because, when the Manchus resumed the war in Liaodong in 1631, they built palisades and forts to cut off the heavily fortified regional capital and, through a combination of bombardment and blockade, forced its surrender within a few weeks. Hong Taiji later incorporated his Chinese volunteers, together

ARMAS, FORTALEZAS E ESTRATÉGIAS MILITARES NO SUDESTE ASIÁTICO – I

with conscripts from Liaodong, into the Banner system (where half of them served as infantry armed with muskets and artillery). By 1642, each of the eight Banners of his army had parallel Manchu, Mongol and Han Chinese components.⁶⁶

That same year the Jesuit Adam Schall reluctantly cast twenty artillery prototypes in a special foundry in the Jesuit mission in Beijing, from which some 500 guns were cast the following year to defend the Ming against the Qing.⁶⁷ It was not enough to save the Ming. Although defended by walls that stretched for over twenty miles, with thirteen huge fortified gates and the largest urban population in the world, when a rebel army approached in spring 1644, Beijing presented a soft target: the garrison had not been paid for five months and food reserves had run low. Some of those to whom the emperor had entrusted the city's defence opened one of the outer gates to the rebels. This still left the Imperial City intact, and the Chongzhen emperor summoned his ministers to make a last-ditch stand there; but no one came. In desperation, he disguised himself as a eunuch and tried to escape, but his own palace guards fired on him and he turned back. At dawn on 25 April 1644, when once again not one official answered his summons, he went into the palace garden and hanged himself from a tree to avoid being captured, humiliated and executed by the victorious rebels.

As the Manchu Grand Army advanced into Jiangnan in 1645, most cities opened their gates and offered tribute to the conquerors, no doubt through fear of the powerful European-style artillery train the Qing brought with them. By May, only Yangzhou held out north of the Yangzi River, and, when it rejected all demands to surrender, a massive artillery bombardment commenced. Since

the city wall was too narrow to mount cannon on top, [the garrison commander] ordered platforms placed at certain ramparts—the fronts perpendicular to the wall and the backs connecting with the roofs of people's residences just inside the wall—to provide more room for mounting cannon. But the work had not been finished. Indeed, [seven days later] when the Qing troops gained the walls, the defenders all made for those platforms, crawling and pulling, hoping to reach the roofs of the houses. But the new platforms, not yet stable, collapsed.⁶⁸

The bombardment soon created a breach in the walls and, as a warning to other cities that might contemplate resistance, the Qing commander allowed his troops to sack Yangzhou for a week. Unseasonable rain prevented the fires lit by the looters from consuming the entire city, but even so the destruction of life and property reached such proportions that poets soon began to refer to Yangzhou as Wucheng 芜城 “the weed-covered city.”⁶⁹ Its fate offers a striking contrast with that of Drogheda and Wexford in Ireland four years later, when Oliver Cromwell used his siege train to batter a breach in the ancient walls and unleashed his troops to carry out a sack as an example of strategic terror that, as in Jiangnan, swiftly produced the surrender of many surrounding towns.⁷⁰

Some years later, in the 1670s, the Kangxi emperor turned to Schall's Jesuit successor, Ferdinand Verbiest, for assistance in casting European artillery and, by the time of his death in 1688, Verbiest had overseen the production of five hundred field pieces and trench mortars for use by the emperor's troops against frontier aggression—especially by the Russians, who used firearms in their attempt to secure the Amur valley—as well as against the *San fan* 三藩 “Three Feudatories” revolt in the far south.⁷¹ Partly because of the difficult terrain and partly because the rebels practised a scorched earth policy as they retreated, it took three years and the deployment of over 150,000 Bannermen (the elite Manchu troops) seconded by 400,000 loyal Chinese troops, backed up by 150 Jesuit-made heavy guns and numerous batteries of field artillery, to regain all the rebel territories. Final suppression of the Revolt of the Three Feudatories came only at the end of 1681.⁷²

The Ming-Qing transition thus provides an interesting contrast with matters in Southeast Asia; but the most comprehensive Asian response to early modern Europe's gunpowder revolution occurred in Japan. Writing in the 1590s, the Jesuit missionary Luís Fróis dismissed Japanese fortifications almost as contemptuously as his colleague Matteo Ricci had just deprecated those of China. Describing Toyotomi Hideyoshi's new fortress at Kyoto, Fróis wrote “Although for Japan, where artillery is not used, it is very strong, nevertheless in comparison with Europe it is very weak, because with four pieces of artillery, everything would be destroyed in half a day.” Even as he wrote, Japan was adapting. In 1578, according to Fróis himself, for the first time the nobles of the island of Kyushu (many

WEAPONS, FORTS AND MILITARY STRATEGIES IN EAST ASIA – I

of them newly converted to Christianity) began to deploy “some artillery pieces” in their wars; and, at the same time, the dominant military leader on the main island, Oda Nobunaga, built a new type of defensive fortification at Azuchi, near lake Biwa, by surrounding a promontory with angled stone walls in such a way that they constituted a solid mass of rock and earth, in which each part offered flanking fire to the rest.⁷³

Although Azuchi was destroyed in 1582, numerous other cannon-proof castles of similar design followed between 1580 and 1630, of which some sixty survive, and Japanese forces built more during the invasion of Korea during the 1590s (just after Fróis wrote). Several of the new fortresses were enormous:

the star-shaped walls of Kumamoto castle, with forty-nine towers and two keeps, extended for almost eight miles; so did those of Osaka castle, composed in part of rocks weighing between 120 and 130 tons each, to a depth in places of almost sixty feet.⁷⁴ Although artillery (both Japanese and European) was occasionally deployed against these targets—most notably at the siege of Osaka in 1614-1615 and during the Shimabara rebellion of 1636-1638—it proved indecisive: the walls were too thick.

The saga of hand-held firearms in Japan followed a similar course. The first Portuguese visitors to Japan in 1543 arrived with some harquebuses (smooth-bore muzzle-loading guns about 1.3 meters long that fired a 20-gram lead ball) in the middle of an era of civil wars that had fragmented the archipelago. Many local warlords, seeing the advantage of adding a powerful

From *Sanjuni-so Ezu* (Book Illustrating Thirty-Two Positions).
Courtesy of National Museum of Japanese History, Sakura.



new weapon to their arsenals, soon ordered their metalworkers to make European-style harquebuses. Like all smoothbore muzzle-loading firearms, however, the Japanese guns proved both highly inaccurate and slow to reload, but in the 1560s Nobunaga, perhaps inspired by the fact that Japanese archers normally fired volleys in rotation, realized that soldiers with firearms drawn up in ranks could maintain a constant barrage, however long it took them to reload, if the first rank fired and then retired to reload while subsequent ranks fired. In 1575, Nobunaga deployed 3,000 men with guns who delivered volleys with devastating effect at the battle of Nagashino.⁷⁵ Hand-held firearms soon became the most important infantry weapons in Japanese armies. “Guns and gunpowder,” Tokugawa Ieyasu, Nobunaga’s sometime lieutenant and eventual successor (after a hiatus), informed the ruler of the Thai kingdom in 1610, are “what I desire more than gold.”⁷⁶ To the Chinese artist of a scroll depicting the Japanese invasion of Korea in

ARMAS, FORTALEZAS E ESTRATÉGIAS MILITARES NO SUDESTE ASIÁTICO – I

the 1590s, it seemed as if all Japanese infantrymen carried muskets; and at the siege of Hara castle in 1638, the last major deployment of Japanese troops in action for two centuries, thirty percent of the government forces possessed handguns.⁷⁷

The striking resemblance between both volley fire and geometrical fortifications in Europe and East Asia might suggest a common source; and, indeed, military conversation—with Europeans among others—formed one of Nobunaga's principal passions. However, no surviving documents demonstrate a connection, and it is noteworthy that Nobunaga devised the idea of the musketry volley some twenty years *before* it emerged in Europe! It seems more likely that the same problems—the vulnerability of vertical defenses to artillery bombardment and the musket's slow rate of fire—gave rise to the same solution in both areas.⁷⁸

The popularity of hand-held gunpowder weapons in Japan led to a proliferation of “Firearms Schools” throughout Japan, producing impressive instruction manuals on a variety of subjects related to guns and their use.⁷⁹ Some of these manuals have recently been closely examined; they include the *Tama koshirae no koto* (“On the making of bullets”), presented by Miyazaki Kurodonosuke to Minami Sakyonosuke in 1585; and the *Ippen ichiryu no sho* (“Book of our sect”) and *Gokuyi sho* (“Esoteric book”), both presented by Inadome Ichimu to Okubo Tozaburo in 1615.⁸⁰ These manuals of the so-called “Inadome School” are significant not only for their contents, but also because it would appear that Okubo Tozaburo was the son of Okubo Nagayasu, an important official who played a significant role in the politics of Edo *bakufu*. In their form, their covers and bindings spare no luxury and are ornamented with silver and gold pigments. Besides, it is apparent that the best calligraphers of the time were employed to produce the manuscripts, and illustrations bear the traces of painters belonging to the Kano school, the most celebrated of that time, founded by Kano Masanobu (1434-1530) at Kyoto and subsequently operating in Edo.⁸¹

And then, Japan “gave up the gun.” First, in 1588 the central government commanded peasants throughout Japan to surrender all their “swords, short swords, bows, spears, muskets, or any other form of weapon”: henceforth, farmers could not legally own any weapons and must instead “engage completely in

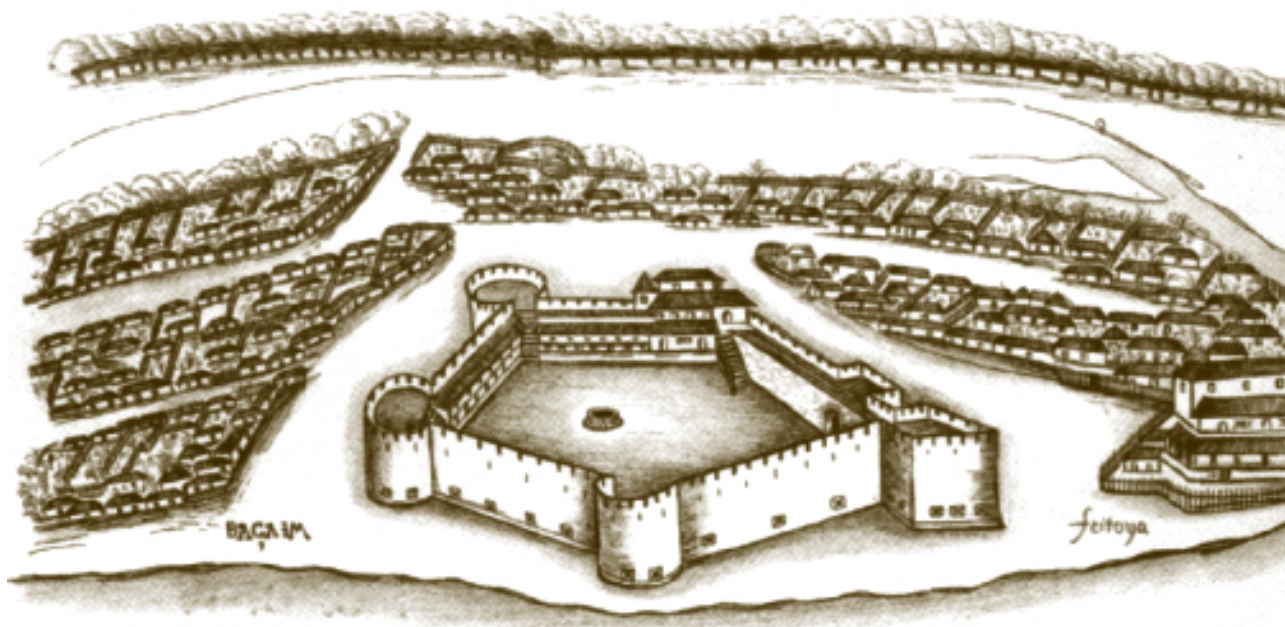
cultivation.” Second, in 1591, government decreed that henceforth *samurai* could not be farmers and farmers could not be *samurai*: members of each social group must not change either their residence or their allegiance, and magistrates must “not harbour anyone who neither performs military service nor engages in [the cultivation of] fields.”⁸² Although some *samurai* remained in their ancestral villages, and a few kept some hidden weapons, the majority relocated and lived with their lord, either on his estates or in the capital. Then, in 1615, having crushed the last of his enemies, Shogun Tokugawa Ieyasu decreed that henceforth each lord could maintain only one castle: they must destroy all others. Taken together, these measures demilitarized Japan. Henceforth the Tokugawa kept the only major arsenal of weapons, and it steadily reduced the production of guns (which could only be made under licence).⁸³ These developments also created a violence-averse culture: for almost two centuries, Japan effectively saw no wars.

V

Responses to the introduction of firearms in different societies of the early modern world can thus be said to run the gamut from enthusiastic acceptance accompanied by innovation to more-or-less outright rejection: a bald contrast between dynamic and forward-looking European military systems and static non-European ones will not work. Innovation and adaptation in military matters may have been unequally distributed across the early modern world, but these differences need to be carefully described and then explained rather than assumed to be natural. In the case of some extra-European societies—in Mexico and Peru, for example—military defeat came so rapidly that there was little time available for adaptation. However, this was certainly not the case in most of Asia, where European conquest, if any, came only after centuries of contact and cohabitation. Most remarkable of all, early modern Japan largely rejected firearms.

In order to explore the puzzling issue of “giving up the gun,” we need to return to the celebrated hypothesis of David Ayalon regarding the end of the Mamluk state in Egypt in the 1510s, a situation in which the European powers were only involved in a secondary fashion. Ayalon argued that, despite

WEAPONS, FORTS AND MILITARY STRATEGIES IN EAST ASIA – I



Bassein. View of the fort and the city. In Gaspar Correia, *Lendas da Índia* (1st half of 16th century).

their long cohabitation, the Mamluks and the Ottomans had by the early 16th century come to make and conceive of war in very different ways.⁸⁴ The Mamluks were committed to forms of heavy cavalry warfare, to severely limiting the place of firearms, and to an immutable composition of their armies. Their military society was one based on a paradox—namely a hierarchical system based on achievement and adherence to norms and discipline rather than ascription and received symbolic capital. The Mamluk institution was, after all, founded on the classic principles of natal alienation and “social death” by which Circassian Turks became members of the Egyptian warrior class. The Ottomans, despite their own use of the *devshirme* and *kul* institutions, were far more flexible, far less concerned with social hierarchies on the battlefield, and far more exposed—on account of their proximity to European states—to the use of gunpowder in its various incarnations, from sieges to the battlefield. This led, in Ayalon’s view, to the rapid collapse of the Mamluk forces in 1516–1517, once the Ottoman Sultan Selim began a serious campaign against them. The two styles of warfare were simply not compatible, and no rules of engagement existed to protect the Mamluks even against their Sunni co-religionists.

The Ayalon model also makes sense in other conflicts in the early modern Middle East. Ottoman warfare also differed markedly from the Safavid way of war in the 1510s. The Qizilbash (or “Red Cap”) supporters of the latter, obsessed with chivalric ideas such as *jawanmardi*, and convinced of the invincible and messianic qualities of their leader Shah Isma‘il, were really no match for the Ottomans in such engagements as was seen in the Battle of Chaldiran in August 1514.⁸⁵ By 1516, the Safavids had begun to reconsider this attitude, but an Iranian agent captured by the Ottomans admitted in that year that even though Shah Isma‘il had had two thousand harquebuses (*tişfek*) made, only twenty janissary deserters in his army really knew how to manipulate them: “they know how to fire, the others [Qizilbash] do not; they only burn their eyes and their faces.”⁸⁶ We might argue here that the Ottomans at this moment represented a particularly pragmatic, efficient and flexible war machine in comparison with their neighbours and rivals in the Islamic world. Their culture of war was of a different order, it would seem, from either that of the Mamluks or Safavids, although the three obviously shared many other cultural traits, as well as a common heritage in terms of concepts of state-building, and a similar politico-institutional vocabulary. This led Rhoads Murphey, in his recent survey of

ARMAS, FORTALEZAS E ESTRATÉGIAS MILITARES NO SUDESTE ASIÁTICO – I

Ottoman warfare, to write of how, save in “exceptional circumstances, the impact of Ottoman warfare, both in terms of its expense and its social costs, was kept within sustainable bounds,” making the Ottomans a “near-perfect military society” in the years from 1500 to 1700.⁸⁷ He thus takes us a fair distance from the oft-cited remark of the Maréchal de Saxe, who in 1732 claimed: “It is hard for one nation to learn from another, either from pride, idleness or stupidity The Turks today are in this situation. It is not valour, numbers or wealth that they lack; it is order, discipline and technique.”⁸⁸

Most other societies of the region were less perfect than Murphey’s Ottomans, and so, if we accept the “Ayalon hypothesis,” we must look closely at how warfare was conceived in different states, and what social and cultural constraints lay upon those tasked

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with making war. Did such constraints weigh on the manner in which firearms were used, accepted, or rejected? Further, rather than pose matters in terms of the “rationality” or “irrationality” of actors from different societies with regard to such questions, would it not be more useful to examine how calculations of costs and benefits were made by the interested parties, who might have been perfectly rational in their own terms? These are large issues, and we cannot hope to do more here than sketch the beginnings of an approach.

Let us consider the problem of cultural constraints on war by returning to South Asia. Even in the mid-18th century, Indian rulers and warlords were often heard to complain about the manner in which the English East India Company (and the Europeans more generally) made war. Thus, Telugu texts of the period often tell us that the English are characterised above all by “deviousness” (*kapatyam*), and a profound incapacity to keep their promises and agreements. The problem of compatibility between cultural norms regarding warfare is also highlighted in certain contemporary

texts discussing the Battle of Bobbili in January 1757, which ended in the total massacre of the garrison of a fortified town in south-eastern India, aged men, women and children included, at the hands of a force spearheaded by the French mercenary and warlord Charles de Bussy-Castelnau. Here, at least one text tells us explicitly that one of the central problems was that “he [Bussy] does not understand our language apparatus (*bhasha-yantram*), and we don’t understand his,” as also that the French have a “gibberish-making language apparatus” (*kikkara-bakkara bhasha yantram*).⁸⁹ The problem is not one, in this portrayal at least, of a literal lack of translation, for there are indeed translators (or *dubashis*) available. Rather, it is a problem of the larger conceptual apparatus, which includes a mix of values, notions of admissible and inadmissible conduct, and so on. Indeed, the outcome of the battle is a serious shock to even Bussy, and a contemporary European chronicler, Robert Orme, tells us that at the end, “the slaughter of the conflict being completed, another much more dreadful presented itself in the area below: the transport of victory lost all its joy: all gazed on one another with silent astonishment and remorse, and the fiercest could not refuse a tear to the deplorable destruction spread before them.”⁹⁰

In his general work on Mughal warfare, Jos Gommans recently attempted to sum up the contrast in the late 18th century between the English Company and the Mughals—two imperial formations locked in a very complex form of combat. In his view, at the heart of the matter was the fact that the Mughals and the Europeans had two quite different conceptions of honour. The Mughals, he writes, had ideas that were characterised by notions of “openness and flexibility” and even “playfulness,” all of which were part of what he terms their “fluid politics.” He adds that “Mughal policy was usually aimed not at destroying but at incorporating the enemy, preferably by means of endless rounds of negotiations.”⁹¹ Gommans contrasts with this the tactics and strategy of the East India Company under Robert Clive and his successors, aimed at monopolising power, which he argues “suddenly and unilaterally changed the rules of the ongoing game.”

What we are offered here is an explanation in fairly broad brushstrokes of why the Mughals could not, in the final analysis, adapt to the new rules of warfare that had emerged after the Military Revolution entered its second, post-1650 phase. Adaptation did, however,

WEAPONS, FORTS AND MILITARY STRATEGIES IN EAST ASIA – I

occur elsewhere, even if it took time. After the Battle of Chaldiran, the Safavids came around to the view in the course of the 16th century that they needed to modify their mode of warfare. In part they did so by imitating the Ottomans, and by the end of the 16th century *ghulams*, or elite slaves, as well as mercenaries recruited from Georgia and the Caucasus, played a major role in the Safavid armies.⁹² In South Asia, change came later, but it once again took radical forms. Gommans's own earlier work shows how "Afghan innovation" between the time of Nadir Shah Afshar in the 1730s and that of the Abdalis in the 1760s significantly changed northern Indian warfare in the 18th century quite independently of the European presence.⁹³ Similarly, the rulers of Mysore, Haidar 'Ali and Tipu Sultan, adapted their style of war in the 1770s and 1780s, and in doing so gave the East India Company's armies quite a scare.⁹⁴ The Anglo-Mysore Wars and the subsequent wars with the Marathas were fought with grim earnestness by both parties; they were by no means a series of combats between two wholly different styles, one earnest and the other playful.⁹⁵

The ostensible distinction between the styles of warfare of Indians and Europeans drew the attention of more than one Mughal commentator. Writing in the mid-18th century, Khwaja 'Abdul Karim Shahristani, a native of Delhi who had travelled with Nadir Shah to Iran, Central Asia and Arabia, noted on his return that the European communities had certain peculiar features which explained their military triumphs in the 1750s and 1760s. In his view, since the Europeans often preferred to live in one area, separate from the Indians, there was no change in their lifestyles (*auza'-o-atwar*) in relation to their places of origin. Further, he noted, they had built churches, where they read their prayers (*namaz*) after their own fashion, and they autonomously determined the outcomes of other affairs too after their own manner, refusing synthesis and mixture—the very essence of the Mughal ethos. As a result, a large number of persons from amongst the "Frankish" intellectuals and craftsmen had settled in their fortified places, where they manufactured things as they did in their own homelands. Little by little, he argued, most of the people of Bengal had become no more than their disciples (*shagird*), and they had become their masters. He

further pointed out that the "Frankish" soldiers (*asab-i saif-i firangiyan*), like their skilled artisans, were also distinguished (*mumtaz*) in what they did. Thus, although the Marathas were aware that all the goods of the great traders of the area were in Chandernagore and Calcutta, and even though these settlements were in reality quite close to Hughli, yet the Marathas did not dare attack these places. This, declares 'Abdul Karim, was principally on account of the perfect unity of the Franks (*bar kamal-i yak jihati-i firangiyan*), with the contrast obviously being then between this unity and the lack of coordination of the nobles of Hindustan, and the single-mindedness of the Franks. He even cites an apposite verse:

Wealth grows out of coordinated acts,
its lack comes out of disunity.⁹⁶

What we have here then is an explanation within the broad framework of "decline" literature, where Indian disunity and lack of cohesion is contrasted to the unity of each of the European groups. 'Abdul Karim here situates Mughal India in a complex framework, where many other societies have drawn ahead of it in one fashion or the other. The Iranians under Nadir Shah had, in his view, defeated the Mughals for similar reasons of unity and efficiency. Yet, he remains unwilling to cede the moral high ground either to the Iranians or to the Europeans, despite their material and, in particular, military superiority.

It is hence important to acknowledge that firearms, as the harbingers of military superiority, evoked quite complex feelings when they appeared in a variety of Asian societies in the course of the early modern period. We may discern this from the instance of the Merina in late 18th-century Madagascar, in particular from the time of King Andrianampoinimerina (1745–1810). The rise of the Merina was quite rapid and spectacular over the course of the 18th century, and it lasted some four decades, from 1780 to 1820,

replacing the earlier dominant power of the Betsimisaraka (literally, the "Great-Never-Divided"), ruled over by Ratsimilao and his successors. Both polities arose in a context in which firearms and gunpowder were quite central. Yet they do not fit the comfortable categories that we are often presented with, since they were neither incapable of adapting and hence doomed to



ARMAS, FORTALEZAS E ESTRATÉGIAS MILITARES NO SUDESTE ASIÁTICO – I

fall by the wayside, nor culturally predestined to adapt and hence capable of riding the crest (as one often views the Japanese). Rather, and here we follow the work of Gerald Berg and Maurice Bloch, it would seem that the Imerina polity used but appreciably transformed the cultural connotations of firearms, which (in Berg's words) became of "relative technical insignificance in determining the outcome of battle," and yet of some deep symbolic significance in the polity at large.⁹⁷ This means that a novel military technology was neither rejected, nor simply accepted in order to mimic another polity that was perceived as more successful.

A similar analysis can fruitfully be adopted for other societies, notably those of southern India. Here, firearms both appealed and appalled, attracted and repelled. It is hard to enter the mentalities of the participants in the Battle of Raichur since neither Portuguese observers such as Fernão Nunes nor the later Indo-Persian chroniclers such as Firishta allow us much access to them. However, we are far more fortunate in relation to the kingdoms that followed the high tide of Vijayanagara in south India, namely the so-called Nayaka states of the later 16th and 17th centuries. Here, firearms suddenly seemed to appear everywhere, from poems of war and accounts of sieges to love-laments that appear on the face of it quite distant from the Military Revolution. In one of the latter, the heroine of the poem, lovesick for her hero and lover, Vijayaraghava Nayaka of Tanjavur, declares:

The Love-God has come through the mountain-pass to attack me;
brandishing his *champaka*-spear,
he's shot his flower-arrows at me.
O Vijayaraghava, strengthen the fortress of your embrace!

The Love-God is campaigning against me.
The soft breezes have set up their camp,
the cuckoos are sounding the drums of war.
Vijayaraghava, send your bright eyes to save me!

The moon is lurking in ambush in the sky;
The Love-God is aiming his Lotus-Gun at me,
packing it full of moonlight-gunpowder.
Vijayaraghava, let me take shelter in your embrace!⁹⁸

The usual weapons of the Hindu Love-God, Manmatha or Kamadeva—namely a bow of sugarcane with a bow-string made of bees, and arrows of flowers—have in this 17th-century image become a lotus-gun (*kendammitupaki*) that must be stuffed full of a moonlight-gunpowder (*vennelamandu*) before it can be fired at a hapless female victim.⁹⁹ Yet, it is interesting to note that the central figure in the poem, namely Vijayaraghava Nayaka, possessed a rather complex relationship to firearms in the final analysis. His end eventually came in 1673, when his capital city of Tanjavur was besieged by forces from the rival Nayaka kingdom of Madurai. Rather than surrender, the Nayaka chose to fight to the death, as reported in both contemporary Dutch sources and Telugu chronicles. The Telugu chronicle version, from the *Tanjavuri andhra rajula charitra*, presents matters thus: having witnessed the death of his son, the aged and somewhat ridiculous Vijayaraghava eventually went into battle against the general (*dalavay*) of Madurai, Venkata Krishnappa.

Vijayaraghava called out: 'You must order your men not to shoot their guns (*tupakulu*) but to fight only with swords and spears. Do you want to know why? Because if one dies from some lousy bullet shot from a distance, he fails to enter heaven (*paralokahani*)—that is nothing like a warrior's death (*ayudhamaranamu*). Don't you know all this yourself?'

As he said this, the Dalavay ordered his musketeers (*tupakulavaru*) to back away, and left only the swordsmen surrounding the king. The king took his sword and began hacking away at the men around him, and they fought back. Several men were cut down in this way by the king. At this, others, standing nearby, became furious and charged at the king with their swords; and Vijayaraghava, calling out in full consciousness, 'Ranganatha, Rajagopala!' [names of the god Krishna] fell to earth and attained heaven.¹⁰⁰

Something of the flavour of this survives even in the rather cynical account from the period of the Venetian adventurer Manucci. The Italian, who probably derived his information from Jesuits residing in south India, wrote of how Vijayaraghava Nayaka "was so full of haughtiness and vainglory that he wanted to imitate one of his gods called Quisina [Krishna], of whom it was said in their Scriptures, that he had the same

WEAPONS, FORTS AND MILITARY STRATEGIES IN EAST ASIA – I

number of wives.”¹⁰¹ This explained the rather bizarre manner in which he ended his life, preferring death on the battlefield to negotiation.

Manucci is also a significant but rather cynical source for early modern Indian warfare and the mentalities that underpinned it. With regard to south India, he wrote,

The government of the Gentiles is the most tyrannical and the most barbarous that one can imagine, because, besides the fact that all the kings are foreigners (*étrangers*), they treat their subjects worse than slaves; all lands belong to the Crown, and there is no subject who has his own lands, or heritage, or possession of any sort that he can leave to his children.¹⁰²

There then follow passages of a considerable virulence, where one can see that Manucci was influenced to a great extent by the Catholic missionaries, who seem to have been amongst his greatest intimates in Madras and Pondicherry. The political economy of the “Gentile” (or Hindu) kingdoms is rapidly eviscerated in a few pages, and Manucci then turns his contemptuous gaze on the manner in which they make war. Here his attention is attracted by the lack of secrecy, the fact that the tactics and strategy of one and the other party are open for all to see, and the role played by money in resolving conflict. He notes: “It is quite normal amongst the Rajas of this Empire to conclude their wars through money, and the one who is the weakest is frequently the one who gains the greatest advantage, and money alone is what they love, for so far as men are concerned, none of the natives of these lands has any love, either for grandeur or for secrets.” Besides, cowardice is the general rule in his view, for “almost all the soldiers in the army have their women and their children with them.” Thus encumbered, with their family on the one hand, and their assorted pots and pans on the other, the soldier has nothing lower on his priorities than to fight. The Gentile soldier is quite willing to fight in one army on a certain day, and desert to the other the next day; so, Manucci concludes,

it is hardly to be marvelled at that when the battle is considered very bloody there are less than a hundred dead and wounded, for as soon as the battle begins, one begins to flee from one or the other side, and they are so fearful of the cavalry that forty thousand foot soldiers will not stand up to two thousand horsemen, and as soon as

they see them from afar, they begin to run faster than the horses, even if the horsemen carry no firearms.

The view here then is of an India that is ripe for European conquest, in view of its incapacity to defend itself, its openness to bribery and negotiation, and the general incompetence of its soldiery. It is a view that is reminiscent in some respects of Spanish and Portuguese claims with regard to Ming China in the late 16th century, which they sometimes asserted would fall into European hands with the effective use of a few hundred soldiers.¹⁰³ If indeed such a broadly culturalist thesis like that of Manucci were valid, it would be difficult to explain the hard-fought battles from 1780 to 1818. Adaptation was possible, but often too little and too late.

VI

The debates of the past two decades on the “Military Revolution Abroad” and the place therein of European firearms have thus tended to follow a set of recognizable patterns. These can be summarized as follows:

1. In the Americas, our knowledge remains broadly stable, with only slight differences in emphasis on the relative importance of military and biological factors, and of firearms and other weapons.
2. In South, Southeast and East Asia, significant changes took place all across the board in the course of the 16th century. Everywhere, firearms were adopted, albeit in a varied mix. The vectors of change were at times Europeans, but in the case of West and South Asia, the place of Muslim intermediaries should not be neglected either.
3. However, these changes were of varied magnitude and had differing consequences. In the Ottoman case competition with European forces, and in the Japanese case the pressures of a civil war, seem to have led to the most extensive changes. In the Mughal and Safavid cases, as in South India, firearms were adopted but “domesticated,” and placed, so to speak, in a niche rather than being allowed to infect the entire military system.
4. Firearms exercised fascination, but also evoked suspicion and even revulsion. Their levelling character was undoubtedly problematic, and they

ARMAS, FORTALEZAS E ESTRATÉGIAS MILITARES NO SUDESTE ASIÁTICO – I

cut to the heart of many warrior cultures that depended on maintaining hierarchies of either ascription or achievement. Also, it is clear that small arms were not seen as producing economies of scale, and were seen as potential means of rebellion as much as of state centralization.

5. Matters came to a head in the 18th century, when competition between European and Asian states reached new levels after a relatively stable 17th century. Many Asian states were now forced to adapt: to take firearms out of their niche and generalize their use, as well as to adopt techniques such as infantry volley fire. While some states succeeded in this, many began to transform themselves too late.
6. If the Europeans found it deceptively easy to conquer areas like Bengal in the 1750s, it proved far more difficult to repeat such feats in the decades that followed. This suggests a continued ability in Asian military systems and techniques to adapt and innovate even at the close of the period from 1500 to 1800. Only when Europeans managed to harness industrial power to military innovation, while the Asian polities did not, did the balance between them tilt decisively for a time; ironically, the “European” armies that emerged in this moment of triumph were often heavily manned by Asian soldiers.

For a sense of this changed balance, which endured perhaps until the middle decades of the twentieth century, it turns out that Bernard Shaw is still an

effective guide. At the close of his play *Arms and the Man*, Sergius Saranoff discovers at last that Bluntschli has been carrying on behind his back with his fiancée Raïna. Incensed, he declares:

You have deceived me. You are my rival. I brook no rivals. At six o'clock I shall be in the drilling-ground on the Klissoura road, alone, on horseback, with my sabre. Do you understand? Bluntschli, described as “sitting quite at his ease,” responds: “Oh, thank you: that’s a cavalry man’s proposal. I’m in the artillery; and I have the choice of weapons. If I go, I shall take a machine gun. And there shall be no mistake about the cartridges this time.” The losers of the Battle of Omdurman in 1898, just four years after *Arms and the Man* opened on the London stage, would surely have understood his meaning. **RC**

Editor’s note: The authors collaborated on this essay to celebrate twenty-five years of friendship. They first met as “observers” at a conference in Panaji (Goa) in January 1983 where only panellists were allowed to speak—a bizarre decision that silenced both of them during sessions but left them desperate to talk afterwards, whether on their way to work in the archives or trying to buy printed sources in the Government Bookshop. They have never stopped. They thank Lisa Balabanlilar and R. Bin Wong for some excellent suggestions, and Taguchi Kojiro for help in locating and translating Japanese sources.

NOTES

- 1 For the changing reception of this play, first performed in 1894 and first published two years later, see Irving McKee, “Bernard Shaw’s beginnings on the London Stage,” *PMLA*, Vol. 74, No. 4, 1959, pp. 470-481.
- 2 See Geoffrey Parker, *The Military Revolution: Military Innovation and the Rise of the West, 1500-1800* (Cambridge: Cambridge University Press 1988; rev. ed., 2001), chaps. 3 and 4; Jeremy Black, *War and the World: Military Power and the Fate of Continents* (London and New Haven: New York University Press, 1998); and idem, *Rethinking Military History* (London: Routledge, 2004).
- 3 For more on these four examples, see (respectively) Lorraine White, “Guerra y revolución militar en la Iberia del siglo XVII,” *Manuscripts*, No. 21, 2003, pp. 63-93; Geoffrey Parker and Rolf Loeber, “The ‘Military Revolution’ in Seventeenth-Century Ireland,” in Geoffrey

Parker, *Success is Never Final: Empire, War and Faith in Early Modern Europe* (New York, Basic Books, 2001), pp. 169-191; Geoffrey Parker, “The Limits to Revolutions in Military Affairs: Maurice of Nassau, the battle of Nieuwpoort (1600), and the Legacy,” *The Journal of Military History*, Vol. 71, 2007, pp. 331-372; and Michael C. Paul, “The Military Revolution in Russia, 1550-1682,” *The Journal of Military History*, Vol. 68, No. 1, 2004, pp. 9-45.

- 4 The use of firearms in naval warfare only proved critical to European expansion in the Americas during the siege of Tenochtitlán, when the Spaniards built boats (“brigantines”) equipped with a centre-line cannon to gain control of the lake that surrounded the Mexica capital: Charles H. Gardiner, *Naval Power in the Conquest of Mexico* (Austin: University of Texas, 1956). The best analysis of the Iberian way of war in America is J. F. Guilmartin. Jr. “The Cutting Edge: An Analysis

WEAPONS, FORTS AND MILITARY STRATEGIES IN EAST ASIA – I

- of the Spanish Invasion and Overthrow of the Inca Empire, 1532-1549," in Kenneth Andrien and Rolena Adorno, eds., *Transatlantic Encounters: Europeans and Andeans in the Sixteenth Century* (Berkeley: University of California Press, 1991), pp. 40-69.
- 5 See the quotations in Charles R. Boxer, "Asian potentates and European artillery in the 16th-18th centuries," *Journal of the Malayan Branch of the Royal Asiatic Society*, Vol. 27, No. 2, 1965, pp. 156-172, at p. 161.
 - 6 Geoffrey Parker, "The Artillery Fortress as an Engine of European Overseas Expansion, 1480-1750," in James D. Tracy, ed., *City Walls: The Urban Enceinte in Global Perspective* (Cambridge: CUP, 2000), pp. 386-416, reprinted with some changes in Geoffrey Parker, *Success is Never Final*, pp. 192-218 and 351-363.
 - 7 Joseph Needham and Robin D. S. Yates (with the collaboration of Krzysztof Gawlikowski, Edward McEwen and Wang Ling), *Science and Civilisation in China*, Vol. V, Pt. 6. *Military Technology: Missiles and Sieges* (Cambridge: CUP, 1994); Joseph Needham, with the collaboration of Ho Ping-Yu, Lu Gwei-djen and Wang Ling, *Science and Civilisation in China*, Vol. V, Pt. 7. *Military Technology: The Gunpowder Epic* (Cambridge: CUP, 1987).
 - 8 See his collected essays in Iqtidar Alam Khan, *Gunpowder and Firearms: Warfare in Medieval India* (Delhi: Oxford University Press, 2004).
 - 9 John E. Woods, "Turco-Iranica I: An Ottoman Intelligence Report on Late Fifteenth/Ninth Century Iranian Foreign Relations," *Journal of Near Eastern Studies*, Vol. 38, No. 1, 1979, pp. 1-9. Also see the earlier discussion in V. Minorsky, transl., *Persia in AD. 1478-1490: An Abridged Translation of Fadlullah b. Rāzibibān Khunjīs 'Tarikh-i 'alam-ara-yi Amīn'* (London: Royal Asiatic Society, 1957).
 - 10 Maria Szuppe, *Entre Timourides, Uzbeks et Safavides: Questions d'histoire politique et sociale de Hérat dans la première moitié du XVI^e siècle* (Paris: Association pour l'Avancement des Études Iranniennes, 1992).
 - 11 For Babur, see Stephen F. Dale, *The Garden of the Eight Paradises: Babur and the Culture of Empire in Central Asia, Afghanistan and India (1483-1530)* (Leiden: Brill, 2004).
 - 12 For this Ottoman technique, see Gábor Ágoston, *Guns for the Sultan: Military Power and the Weapons Industry in the Ottoman Empire* (Cambridge: CUP, 2005). For possible Ottoman influences on Babur, see also Ali Anooshahr, "The Ghazi Sultans and the Frontiers of Islam," Department of History, UCLA, Ph.D. dissertation, 2005, pp. 193-206.
 - 13 Wheeler Thackston, trans. and ed., *The Babur Nama: Memoirs of Babur, Prince and Emperor* (New York: Random House, 2002), pp. 368-369.
 - 14 Thackston, trans., *The Babur Nama*, p. 409.
 - 15 For Sher Shah, no really satisfactory study exists, but see Iqtidar Husain Siddiqui, *Shershah Sur and his Dynasty* (Jaipur: Publication Scheme, 1995); and more recently, Raziuddin Aquil, *Sufism, Culture, and Politics: Afghans and Islam in Medieval North India* (Delhi: Oxford University Press, 2007). On his death, see João de Barros, *Da Ásia, Década Quarta*, Parte 2 (reprint, Lisbon: Livraria Sam Carlos, 1973), pp. 526-527: "a bombarda rebentou de maneira, que fez Xiah Olam [Shah 'Alam, ie. Sher Shah] em tantos pedaços, que sómente foi conhecida sua cabeça entre outros muitos."
 - 16 Jos Gommans, *Mughal Warfare: Indian Frontiers and High Roads to Empire, 1500-1700* (London: Routledge, 2002), p. 148.
 - 17 For the Portuguese sources, see David Lopes, ed., *Crónica dos Reis de Bisnaga* (Lisbon: Imprensa Nacional, 1897), pp. 28-57; and for the chief Persian source from the early 17th century, Muhammad Qasim Hindushah Astarabadi 'Firishta', *Tarikh-i Firishta: Muslim 'ahd ki 'azim tarikh-i dastan ka mustanad aur mu'arkata alara muraqqa'*, Urdu trans. by Khwaja 'Abdul Ha'i, 2 Vols. (Lahore, 1962). For an overview, see Sanjay Subrahmanyam, "The 'Kagemusha Effect': The Portuguese, Firearms and the State in Early Modern South India," *Moyen Orient et Océan Indien*, No. 4, 1987, pp. 97-123.
 - 18 Richard M. Eaton, "'Kiss my Foot,' said the King: Firearms, Diplomacy and the Battle of Raichur, 1520," *Modern Asian Studies*, Vol. 43, No. 1, 2009, pp. 289-313, on p. 310.
 - 19 Rainer Daehnhardt, *The Bewitched Gun: The Introduction of the Firearm in the Far East by the Portuguese* (Lisbon: Texto Editora, 1994).
 - 20 For Portuguese attitudes towards this settlement in Diu, see Instituto dos Arquivos Nacionais/Torre do Tombo, Lisbon, *Cartas dos Vice-Reis da Índia*, No. 17, "Cartas de João III para D. Henrique, capitão-mor da Índia, sobre a tomada da Vila de Rumes," *Tomar*, September 7, 1526.
 - 21 For the reign of Sultan Bahadur, see Sanjay Subrahmanyam, "A Crónica dos Reis de Bisnaga e a Crónica do Guzerate: Dois Textos Indo-Portugueses do século XVI," in Mafalda Soares da Cunha, ed., *Os Construtores do Oriente Português* (Lisbon-Oporto: CNCDB, 1998), pp. 131-154; and for Khudawand Khan, see Subrahmanyam, "A note on the rise of Surat in the sixteenth century," *Journal of the Economic and Social History of the Orient*, Vol. 43, No. 1, 2000, pp. 23-33.
 - 22 On Cabral and Gama, see Sanjay Subrahmanyam, *The Career and Legend of Vasco da Gama* (Cambridge: CUP, 1997), pp. 179-181 and 215-216.
 - 23 Instructions issued by Dom Manuel of Portugal in February 1500, in W. B. Greenlee, ed., *The Voyage of Pedro Álvares Cabral to Brazil and India* (London: Hakluyt Society, 1938), p. 183.
 - 24 Gaspar Correia, *Lendas da Índia*, Vol. I, ed. M. Lopes de Almeida (Oporto: Lello & Irmão, 1975), pp. 329-332.
 - 25 Luís de Albuquerque, ed., *Crónica do Descobrimento e Primeiras Conquistas da Índia pelos Portugueses* (Lisbon: Imprensa Nacional-Casa da Moeda, 1986), pp. 332-333. For another account, compare João de Barros, *Da Ásia, Década Segunda*, Parte 1 (reprint, Lisbon: Livraria Sam Carlos, 1973), pp. 191-206.
 - 26 Vitorino Magalhães Godinho, *Os Descobrimentos e a Economia Mundial*, 4 Vols. (Lisbon: Ed. Presença, 1983), Vol. III, pp. 100-101.
 - 27 Jean Aubin, "Albuquerque et les négociations de Cambaye," in Aubin, *Le Latin et l'Astrolabe II: Recherches sur le Portugal de la Renaissance, son expansion en Asie et les relations internationales* (Paris: Centre Culturel Calouste Gulbenkian, 2000), pp. 207-208. Compare the highly patriotic but problematic account of the two engagements of 1508 and 1509 in Saturnino Monteiro, *Batalhas e Combates da Marinha Portuguesa*, Vol. I (1139-1521) (Lisbon: Sá da Costa, 1989), pp. 157-192, which does, however, contain some useful maps and technical information.
 - 28 Quoted in Joaquim Candeias Silva, *O Fundador do "Estado Português da Índia", D. Francisco de Almeida, 1457 (?) - 1510* (Lisbon: IN-CM, 1996), pp. 387-388.
 - 29 R. A. de Bulhão Pato and H. Lopes de Mendonça, eds., *Cartas de Afonso de Albuquerque, seguidas de documentos que as elucidam*, 7 Vols. (Lisbon: Academia Real das Ciências, 1884-1935), Vol. I, p. 203, letter from Albuquerque to Dom Manuel, Cannanore, 4 December 1513, in which he refers to a temporary improvement in relations with Bijapur, and the circulation of artisans between the two territories.
 - 30 Seydi Ali Reis, *Mir'atü'l-Memalik*, ed. Mehmet Kiremit (Ankara: Türk Dil Kurum, 1999), p. 100. For a discussion, also see Muzaffar Alam and Sanjay Subrahmanyam, *Indo-Persian Travels in the Age of Discoveries, 1400-1800* (Cambridge: CUP, 2007), pp. 107-109.
 - 31 Iqtidar Alam Khan, "Muskets in the mawas: Instruments of peasant resistance," in K. N. Panikkar, T. J. Byres and Utsa Patnaik, eds., *The Making of History: Essays Presented to Irfan Habib* (London: Anthem Press, 2002), pp. 81-103, at p. 93, quoting Peter Mundy.

ARMAS, FORTALEZAS E ESTRATÉGIAS MILITARES NO SUDESTE ASIÁTICO – I

- 32 Dirk H. A. Kolff, *Naukar, Rajput and Sepoy: The Ethnohistory of the Military Labour Market in Hindustan, 1450-1850* (Cambridge: CUP, 1990), pp. 169-176.
- 33 Olga Pinto, ed., *Viaggi alle Indie orientali di Cesare Federici e Gasparo Balbi* (Rome: Libreria dello Stato, 1962), pp. 162-163.
- 34 Piero Strozzi—a Florentine, hence his rejoicing—writing on 20 December 1510, just after the capture of Goa, quoted by Sanjay Subrahmanyam, *The Political Economy of Commerce: Southern India, 1500-1650* (Cambridge: CUP, 1990), p. 255. See numerous other examples of “renegades” in A. D. da Costa, “Os Portugueses e os Reis da Índia,” *Boletim do Instituto Vasco da Gama*, Vol. 13, 1932, pp. 1-45, Vol. 15, 1932, pp. 1-38, Vol. 18, 1933, pp. 1-28, and Vol. 20, 1933, pp. 1-40; and Maria Augusta Lima Cruz, “Exiles and renegades in early sixteenth-century Portuguese Asia,” *The Indian Economic and Social History Review*, Vol. 23, 1986, pp. 249-262, especially pp. 259-262.
- 35 Donald F. Lach and Edwin J. van Kley, *Asia in the Making of Europe*, Vol. III: *A Century of Advance* (Chicago: University of Chicago Press, 1993), p. 726, quoting Bernier and Fryer. See also Sanjay Subrahmanyam, “The Kagemusha effect”; John F. Richards, *The Mughal Empire, The New Cambridge History of India*, Vol. I. 5 (Cambridge: CUP, 1993), pp. 220-222; Nicolò Manucci, *Storia do Mogor, or Mogul India 1653-1708*, 4 Vols., ed. William Irvine (London, 1906-1908), Vol. 1, pp. 309, 313; and François Bernier, *Travels in the Mogul Empire, AD 1656-1668*, ed. A. Constable (London, 1891), pp. 31-32.
- 36 Manucci, *Storia do Mogor*, Vol. 1, pp. 183-184; William Methwold (writing in the 1620s) quoted in Lach and van Kley, *Asia*, Vol. 3, p. 1023. See also Sidney Toy, *The Strongholds of India* (London: Heinemann, 1957), pp. 53-60 (for Golconda) and p. 123 (for Delhi); and John F. Richards, *Mughal Administration in Golconda* (Oxford: Clarendon Press, 1975), pp. 48-51.
- 37 Marshall G. S. Hodgson, *The Venture of Islam*, III: *The Gunpowder Empires and Modern Times* (Chicago: University of Chicago Press, 1974); and for a critical view, Douglas E. Streusand, *The Formation of the Mughal Empire* (Delhi: Oxford University Press, 1989), pp. 8-13, 51-70.
- 38 Gommans, *Mughal Warfare*, p. 166.
- 39 On the Safavids, see Rudi Matthee, “Unwalled Cities and Restless Nomads: Gunpowder and Artillery in Safavid Iran,” in Charles Melville, ed., *Safavid Persia: The History and Politics of an Islamic Society* (London: I.B. Tauris & Co., 1996), pp. 389-416.
- 40 For the siege of Hughli, see Sanjay Subrahmanyam, *Explorations in Connected History: From the Tagus to the Ganges* (Delhi: Oxford University Press, 2005), pp. 38-42.
- 41 Günhan Börekçi, “A Contribution to the Military Revolution Debate: The Janissaries’ Use of Volley Fire during the long Ottoman-Habsburg War of 1593-1606 and the Problem of Origins,” *Acta Orientalia Academiae Scientiarum Hungaricae*, Vol. 59, No. 4, 2006, pp. 407-438.
- 42 *Lettera di Giovanni da Empoli [1514]*, ed. A. Bausani (Rome: Istituto Italiano per il Medio ed Estremo Oriente, 1970), p. 132; letter from nineteen Portuguese captives in Melaka to Albuquerque, 6 February 1510, in *Cartas de Affonso de Albuquerque*, Vol. III, p. 5. The captives claimed that Melaka’s 10,000 buildings included only 500 of adobe, the rest being of “straw like those of India.” However, the mosques at least were made of stone because, as Empoli recorded, Albuquerque recycled them for *A Famosa*. For this Italian traveller, also see Marco Spallanzani, *Giovanni da Empoli, un mercante fiorentino nell’Asia portoghese* (Florence: SPES, 1999). For a brilliant survey of Melaka before the conquest, see Luís Filipe F. R. Thomaz, “The Malay sultanate of Melaka,” in Anthony Reid, ed., *Southeast Asia in the Early Modern Era: Trade, Power, and Belief* (Ithaca, NY: Cornell University Press, 1993), pp. 69-90.
- 43 *Lettera di Giovanni da Empoli*, 135-136. The explicit reference to gunpowder weapons among the defenders of Melaka contradicts the oft-quoted account in the *Sejarah Melayu*, which stresses the fear and surprise caused by the Europeans’ bombardment (“What may be this round weapon that yet is sharp enough to kill us?”: “Sejarah Melayu or ‘Malay Annals,’” ed. C. C. Brown, *Journal of the Malayan Branch of the Royal Asiatic Society*, Vol. 25, Nos. 2-3, 1952, pp. 12-204, at p. 158.) However, the *Sejarah* was compiled from oral traditions in 1612, whereas Empoli (an eye-witness) wrote in 1514; moreover, although the defenders of Melaka may have possessed gunpowder weapons, it seems unlikely that they were as effective—or were deployed as effectively—as those of the Europeans.
- 44 Angelo de Gubernatis, *Storia dei viaggiatori italiani nelle Indie orientali* (Livorno, 1875), p. 376 (from an anonymous Italian account of the fall of Melaka.)
- 45 *Lettera di Giovanni da Empoli*, p. 138. Empoli reported the same pattern at the capture of Goa in 1510: as soon as the city fell, Albuquerque began to construct a stone castle (p. 121.)
- 46 Albuquerque to Dom Manuel, 30 November 1513, in *Cartas de Affonso de Albuquerque*, Vol. 1, p. 127 (“artelheria e armas e fortalezas he ja tudo tornado a nosa husamça”—alas, he did not provide details.)
- 47 See *Lettera di Giovanni da Empoli*, 132-133, written in 1514, and specifically contrasting the “walled cities, houses, buildings, castles of great strength, and artillery of every sort like our own” found in China with the lack of fortifications in Indonesia.
- 48 Lach and van Kley, *Asia in the Making of Europe*, Vol. III, pp. 1202, 1216 (based on the accounts of Louis XIV’s envoy to the court of Siam, Simon de la Loubère, published in 1691, and of the French missionary, Nicolas Gervaise, published in 1688).
- 49 L. Cadière, “Le quartier des Arènes: I. Jean de la Croix et les premiers Jésuites,” *Bulletin des Amis du Vieux Hué*, Vol. 14, No. 4, 1924, pp. 307-332, at p. 312 (citing a report of 1683); Lach and van Kley, *Asia*, Vol. III, p. 1264 (from the 1631 “Relation” of Christoforo Borri); p. 1281 (citing Alexandre de Rhodes in 1641); and p. 1298. For other examples of “flight” as a reaction, see also Geoffrey Parker, *Military Revolution*, p. 122 (Malaysia.)
- 50 See Victor B. Lieberman, “Europeans, trade and the unification of Burma. c. 1540-1620,” *Oriens Extremus*, Vol. 27, No. 2, 1980, pp. 203-26; Anthony Reid, *Southeast Asia in the Age of Commerce, 1450-1680*, Vol. Two: *Expansion and Crisis* (New Haven: Yale University Press, 1993), pp. 78-82; and Lach and van Kley, *Asia*, Vol. III, pp. 1122-1146.
- 51 See Lach and van Kley, *Asia*, Vol. III, pp. 1124-8 and pp. 1193-4 for details.
- 52 See Reid, *Southeast Asia*, pp. 87-8. On Aceh, also see Jorge M. dos Santos Alves and Pierre-Yves Manguin, *O Roteiro das Cousas do Achém’ de D. João Ribeiro Gaio: Um Olhar Português sobre o Norte de Samatra em Finais do Século XVI* (Lisbon: CNCDP, 1997), pp. 68-76.
- 53 Details from Lach and van Kley, *Asia*, Vol. III, p. 1444 (from the eye-witness description of Seyger van Rechteren, who visited Makassar in 1635); G. Vermeulen, *De Gedenkwaerdige Voyagie* (Amsterdam, 1677), p. 67; and Reid, *Southeast Asia*, p. 88. A map of this date from the “Secret Atlas of the East India Company” showing Sombaopu, in colour, is in Anthony Reid, “Southeast Asian cities before colonialism,” *Hemisphere*, Vol. 28, No. 3, 1983, pp. 144-149, at p. 144.
- 54 Anthony Reid, “The rise of Makassar,” *Review of Indonesian and Malaysian Affairs*, Vol. 17, 1983, pp. 117-160, at pp. 141-142. However (Professor Reid informs us), one can see today from the substantial ruins that the bricks used were thinner than European ones.
- 55 Personal communication from Anthony Reid, 24 March 1995; see also Lach and van Kley, *Asia*, Vol. III, p. 1446 (citing Domingo Fernández de Navarrete, who visited Makassar in 1657.)

WEAPONS, FORTS AND MILITARY STRATEGIES IN EAST ASIA – I

- 56 Details from the eye-witness accounts in Reid, "The rise of Makassar," p. 150; Vermeulen, *Voyagie*, pp. 53-71; and Wouter Schouten, *Reys-togten naar en door Oostindien* (Amsterdam, 1708), pp. 85-93. See also the pictures of the Dutch bombardment of Pannakkukang in Reid, *Southeast Asia*, p. 279, and in Schouten, *Reys-togten*. Leonard Andaya, *The Heritage of Arung Palakka: A History of South Sulawesi (Celebes) in the Seventeenth Century* (The Hague: Koninklijk Instituut voor Taal, Land- en Volkenkunde, 1981), pp. 130-133, offers a good account of the fall of Makassar to the combined forces of the Dutch and of Arung Palakka's Bugis.
- 57 Details from Anthony Reid, "Sixteenth-century Turkish influence in western Indonesia," *Journal of South-East Asian History*, Vol. 10, No. 3, 1969, pp. 395-414; also see Giancarlo Casale, "His Majesty's Servant Lutfi: The career of a previously unknown 16th-century Ottoman envoy to Sumatra based on an account of his travels from the Topkapi Palace Archives," *Turica*, Vol. 37, 2005, pp. 43-81.
- 58 See C. R. Boxer, "The Achinese attack on Malacca in 1629, as described in contemporary Portuguese sources," in *Malayan and Indonesian studies: Essays Presented to Sir Richard Winstedt on his 85th Birthday*, eds. J. Bastin and R. Roolvink (Oxford: Clarendon Press, 1964), pp. 105-121 (reprinted in Boxer, *Portuguese Conquest and Commerce in Southern Asia, 1500-1750* [London: Variorum, 1985], chap. 5.)
- 59 Timothy Brook, *The Confusions of Pleasure: Commerce and Culture in Ming China* (Berkeley: University of California Press, 1999), p. 157.
- 60 See the printed German translation: Ch'i Chi-Kuang, *Praxis der Chinesischen Kriegsführung* (ed. and tr. Kai Werhahn-Mees, Munich: Bernard and Graefe, 1980), and the discussion in James F. Miller, "Ch'i Chi-kuang: A study of civil-military roles and relations in the career of a sixteenth-century warrior, reformer and hero," (Yale University Ph. D. thesis, 1968); Joanna F. Handlin, *Action in Late Ming Thought: The Re-orientation of Lü K'un and other Scholar Officials* (Berkeley: University of California Press 1983), pp. 183-185; and Chengmain Wang, *The Life and Career of Hung Ch'eng-ch'ou (1593-1665): Public Service in a Time of Dynastic Change* (Ann Arbor: Association for Asian Studies, 1999), pp. 89-93 and 253-255.
- 61 *Catálogo de los documentos relativos a las Islas Filipinas existentes en el Archivo General de Indias de Sevilla*, eds. P. Torres Lanzas and F. Navas del Valle (Barcelona, 1926), Vol. 2, pp. clxxxiii-iv; and Matteo Ricci to Juan Bautista Román, 13 September 1584, in F. Colin and P. Pastells, *Labor evangélica de los obreros de la Compañía de Jesús en las islas Filipinas*, (Barcelona, 1902), Vol. 3, pp. 448-452. On Ricci's acute military sense (and contempt for Chinese military skills), see Jonathan D. Spence, *The Memory Palace of Matteo Ricci* (London: Oxford University Press, 1983); on the terror that paralyzed maritime China at the time, see K. W. So, *Japanese Piracy in Ming China During the Sixteenth Century* (East Lansing, MI: Michigan State University Press, 1975). However, Ricci was not quite correct: some geometrical defences have been discovered in Chinese sources – see Needham and Yates, *Science and Civilisation in China*. Vol. 5. Part VI: *Military Technology: Missiles and Sieges*, pp. 260-265. Moreover, some Chinese vertical walls proved thick enough to resist even the most ferocious artillery bombardment.
- 62 Ricci by no means stood alone in this: see the optimistic views of other Europeans in Asia quoted in Geoffrey Parker, "David or Goliath? Philip II and his world in the 1580s," in Richard L. Kagan and Geoffrey Parker, eds., *Spain, Europe and the Atlantic World: Essays in Honour of John H. Elliott* (Cambridge: CUP, 1995), pp. 245-266, at 254-256; and J. M. Headley, "Spain's Asian presence, 1565-1590: Structures and aspirations," *Hispanic American Historical Review*, Vol. 75, 1995, pp. 623-646.
- 63 Pascale Girard, ed., *Le voyage en Chine d'Adriano de las Cortes, S. J. (1625)* (Paris: Chandeigne, 2001), pp. 183-188. An Italian Jesuit likewise commented in the 1650s on "the little skill the Chinese had in the use of their muskets" (Martino Martini, *Bellum tartaricum; or, The Conquest of the Great and most Renowned Empire of China ...* [London, 1654], p. 259).
- 64 Álvaro Semedo, S. J., *Historica relatione del gran regno della Cina* (Rome, 1653), 126-127. Semedo arrived in South China in 1613 and remained there, with some breaks, until 1637.
- 65 Girard, *Le voyage en Chine*, pp. 183-188; Chang Chun-shu and Shelley Hsueh-lun Chang, *Crisis and Transformation in Seventeenth-century China: Society, Culture, and Modernity in Li Yu's world* (Ann Arbor: University of Michigan Press, 1992), p. 269 (who also note that the popular writer and publisher, Li Yu [1611-1680], wrote plays and short stories that featured the miseries and mutinies of late Ming troops).
- 66 Frederic C. Wakeman, *The Great Enterprise: The Manchu Reconstruction of Imperial Order in 17th-century China* (Berkeley: University of California Press, 1985), pp. 168-170, provides details on the transfer of technology; and on pp. 170-190 describes the siege of Dalinghe, "an important turning point in the [Manchu] quest for power." See also Nicola Di Cosmo, "Did guns matter? Firearms and the Qing formation," in Lynn A. Struve, ed., *The Qing Formation in World-historical Time* (Cambridge, MA: Harvard University Press, 2004), pp. 121-166, at pp. 139-140; and Huang Yi-long, "Sun Yuanhua: A Christian convert who put Xu Guangqi reform policy into practice," in C. Jami, P. Engelfriet and G. Blue, eds., *Statecraft and Intellectual Renewal in Late Ming China: The Cross-cultural Synthesis of Xu Guangqi (1562-1633)* (Leiden: Brill, 2001), pp. 225-259, at pp. 234-241. Mark C. Elliott, *The Manchu Way: The Eight Banners and Ethnic Identity in late Imperial China* (Stanford: Stanford University Press, 2001), p. 75, notes that the eight Chinese banners "appear to have been expanded in stages": two date from 1637, two more from 1639 and the rest from 1642.
- 67 See, in general, Di Cosmo, "Did guns matter?"
- 68 Lynn A. Struve, *Voices from the Ming-Qing Cataclysm: China in Tigers' Jaws* (New Haven: Yale University Press, 1993), p. 33, the eye-witness account of Wang Xiuchu
- 69 Ibid. See also the reconstruction in Wakeman, *Great Enterprise*, pp. 556-563, and Tobie Meyer-Fong, *Building Culture in Early Qing Yangzhou* (Stanford: Stanford University Press, 2003), pp. 14-20.
- 70 See details in Geoffrey Parker, *Success is Never Final*, pp. 158-159. See also J. Burke, "The New Model Army and the Problems of Siege-Warfare, 1648-1651," *Irish Historical Studies*, Vol. 27, 1990, pp. 1-29.
- 71 See, in general, Di Cosmo, "Did guns matter?"
- 72 Willard J. Peterson, ed., *The Cambridge History of China, Vol. IX, Part 1: The Ch'ing Dynasty to 1800* (Cambridge: CUP, 2002), pp. 144-145, contains a striking map of the suppression of the Three Feudatories. For excellent insight on the last stages in the re-conquest, see Nicola Di Cosmo, ed., *The Diary of a Manchu Soldier in Seventeenth-Century China: 'My Service in the Army' by Dzung'ee* (New York: Routledge, 2006), which prints in English the journal kept by a middle-rank Manchu officer in 1680 and 1681, together with an impeccable introduction. For the "light but effective cannon, convenient for transportation" cast by Ferdinand Verbiest, a scientifically-minded Jesuit, for use against the Three Feudatories, see Di Cosmo, "Did guns matter?," pp. 151-155; G. Stary, "The 'Manchu cannons' cast by Ferdinand Verbiest and the hitherto unknown title of his instructions," in J. W. Wittek, ed., *Ferdinand Verbiest (1623-1688): Jesuit Missionary, Scientist and Diplomat* (Nettetal, 1994), pp. 215-225, with a description of seventeen of Verbiest's surviving guns; and Peter C. Perdue, "Military mobilization in seventeenth- and eighteenth-century China, Russia, and Mongolia," *Modern Asian Studies*, Vol. 30, 1996, pp. 757-793.
- 73 Ricci quoted above; Luís Fróis, *História do Japão*, ed. J. Wicki (Lisbon: Biblioteca Nacional, 1984), Vol. 5, p. 315 (sub anno 1591-1592,

ARMAS, FORTALEZAS E ESTRATÉGIAS MILITARES NO SUDESTE ASIÁTICO – I

- part of an interesting chapter comparing various types of building in Europe and Japan); see also, Vol. 3, pp. 41-42 (for 1578), Vol. 4, pp. 54-55 (for 1584) and so on. See the interesting discussion in João Paulo Oliveira e Costa, “A introdução das armas de fogo no Japão pelos Portugueses à luz da história do Japão de Luís Fróis,” *Estudos Orientais*, No. 3, 1992, pp. 113-129, at pp. 126-128. Other, more favourable, European descriptions of Japanese castles appear in *They Came to Japan: An Anthology of European Reports on Japan, 1543-1640*, ed. M. Cooper (Berkeley: University of California Press, 1965), pp. 131-141.
- 74 See Geoffrey Parker, *Military Revolution*, pp. 142-143 and references on p. 232.
- 75 More on Nagashino in Parker, *Military Revolution*, pp. 140-142, and pp. 231-232 nn. 77-79. Since then, see Fujimoto Masayuki, *Nobunaga no Sengoku Gunjigaku* [Nobunaga and Strategy in the Warring States period] (Tokyo: Yousensha, 1997), pp. 223-232, who has pointed out that the accounts of the battle that exalted Nobunaga's role and described his use of volley fire were written long afterwards and therefore may not be reliable. A modern representation of Nagashino forms the centerpiece of the film *Kagemusha/The Shadow Warrior* (1980), directed by Kurosawa Akira.
- 76 Quotation from E. M. Satow, “Notes on the intercourse between Japan and Siam,” *Transactions of the Asiatic Society of Japan*, Vol. 13, 1884-1885, p. 145.
- 77 See in this issue Matthew Keith, “‘Taking up the Gun’: Early Modern Japanese Firepower and the Siege of Hara Castle,” pp. 77-95. See also the illustration from another Chinese scroll depicting the invasion of the 1590s, “Victory over Japanese invaders,” reproduced in Bardley Smith and Wang-go Weng, *China: A History in Art* (London: Studio Vista, 1973), p. 234. On the siege of Hara, see Keith, “The logistics of power.”
- 78 For Nobunaga's love of military conversation, see Alessandro Valignano, *Sumario de las cosas de Japón (1583)*, ed. J. L. Alvarez-Taladriz (Tokyo: Sophia University, 1954), p. 152.
- 79 Noel Perrin, *Giving Up the Gun: Japan's Reversion to the Sword, 1453-1879* (Boston: David R. Godine, 1979); Peter Kornicki, *The Book in Japan: A Cultural History from the Beginnings to the 19th Century* (Honolulu: University of Hawai'i Press 2001).
- 80 Utagawa Takehisa, “Hojutsu densho wa jidai no kagami” [Manuals of gunnery reflect the times], *Rekihaku*, Vol. 108, 2002, pp. 2-5.
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- 82 Ryusaku Tsunoda et al., *Sources of Japanese Tradition*, Vol. I (New York: Columbia University Press, 1964), pp. 328-331, prints Hideyoshi's “Sword collection edict” and “Restrictions on change of status and residence.” Mary Elizabeth Berry, *Hideyoshi* (Cambridge, Mass.: Harvard University Press, 1982), pp. 102-110, expertly discusses these edicts, noting that “no Japanese leader had ever attempted a nationwide purge of arms” (p. 104) and that the 1591 edict was “absolutely without precedent in Japan” (p. 107).
- 83 Noel Perrin, *Giving Up the Gun*, pp. 64-65.
- 84 David Ayalon, *Gunpowder and Firearms in the Mamluk Kingdom: A challenge to a Medieval Society* (London: Frank Cass & Co., 1956). This view was generalized by Jean-Claude Garcin, “The Mamluk Military System and the Blocking of Medieval Moslem Society,” in Jean Baechler, John A. Hall and Michael Mann, eds., *Europe and the Rise of Capitalism* (Oxford: Basil Blackwell, 1988), pp. 113-130.
- 85 Jean-Louis Bacqué-Grammont, *Les Ottomans, les Safavides et leurs voisins: Contribution à l'histoire des relations internationales dans l'Orient islamique de 1514 à 1524* (Istanbul: Institut Historique et Archéologique Néerlandais, 1987), pp. 146-186.
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- 87 Rhoads Murphey, *Ottoman Warfare, 1500-1700* (New Brunswick: Rutgers University Press, 1999), p. 192.
- 88 Saxe, *Réveries* (written 1732), quoted by V. J. Parry, “La manière de combattre,” in V. J. Parry and M. E. Yapp, eds., *War, Technology and Society in the Middle East* (Oxford: Oxford University Press, 1975), pp. 218-256, at p. 256.
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- 100 Ibid., pp. 147-148.
- 101 Manucci, *Mogul India, or Storia do Mogor*, trans. Irvine, Vol. III, p. 100. This passage does not appear in the Portuguese text in the Biblioteca Nazionale Marciana, Venice, Codex Zanetti, It. 44 (=8299), pp. 433-435, and seems to derive from the other Manucci manuscript at the Staatsbibliothek zu Berlin.
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